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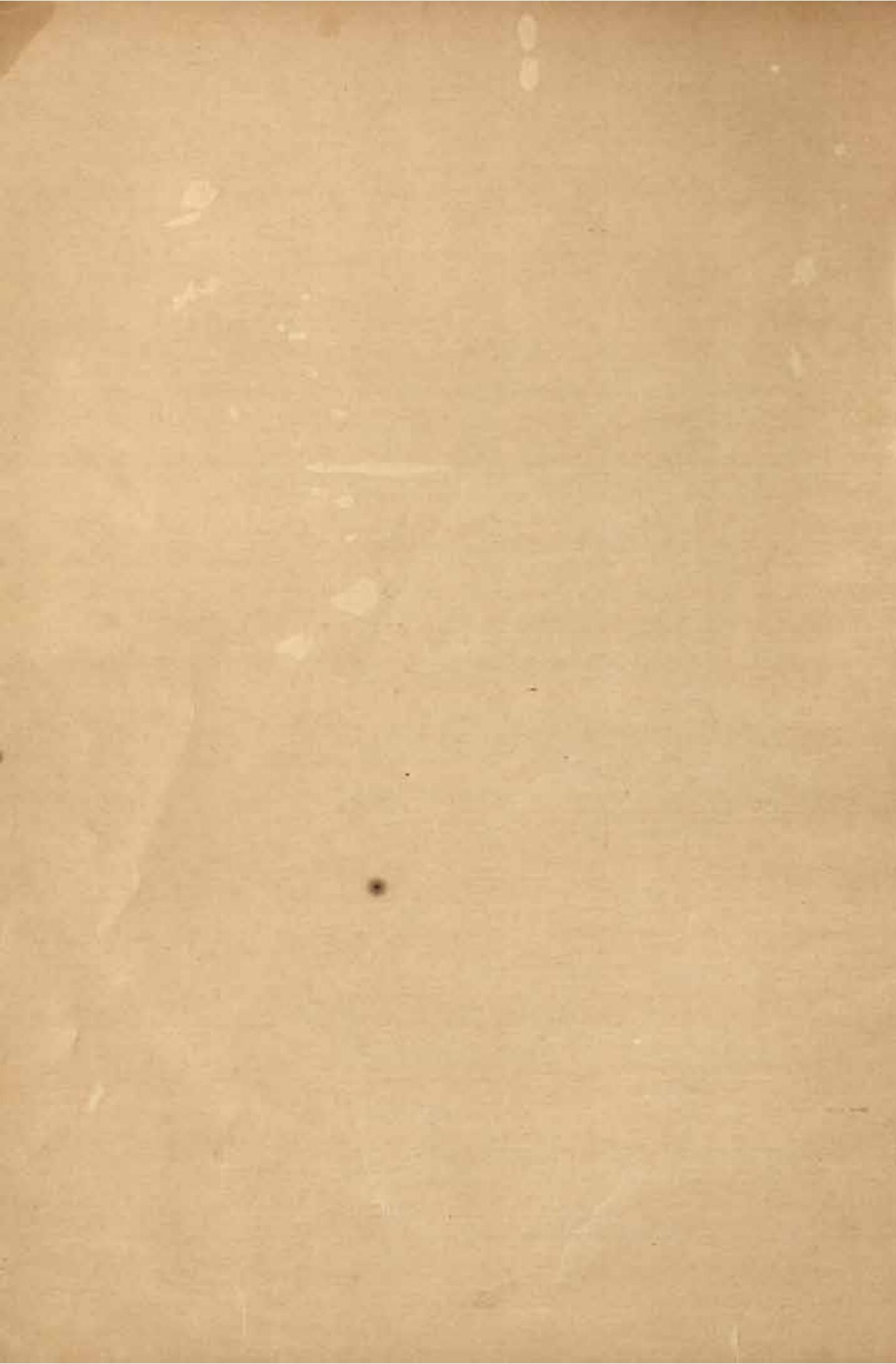
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FLOWERING TREES
AND SHRUBS
IN INDIA

Flowering Trees and Shrubs In India

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BY
D. V. COWEN

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Limited, Bombay.

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INTRODUCTION

EVERY year, from March to May, when the air is at its hottest, the ground is parched and cracked and a film of dust covers every leaf and branch, one watches in awe that miracle of nature which brings forth from the branches of so many trees such an extravagant abundance of colourful blossoms and clean, polished foliage. From where, one asks, do these trees get sufficient moisture when no rain has fallen for months. The bright, new leaves alone, would be a happy sight and one's eyes, tired with the incessant glare of an Indian summer gladly rest on them, but with blossoms of every hue as well it is impossible to be unaware of the galaxy of colour. It is at this time of the year that so many people feel an urge to learn more about the trees they live amongst.

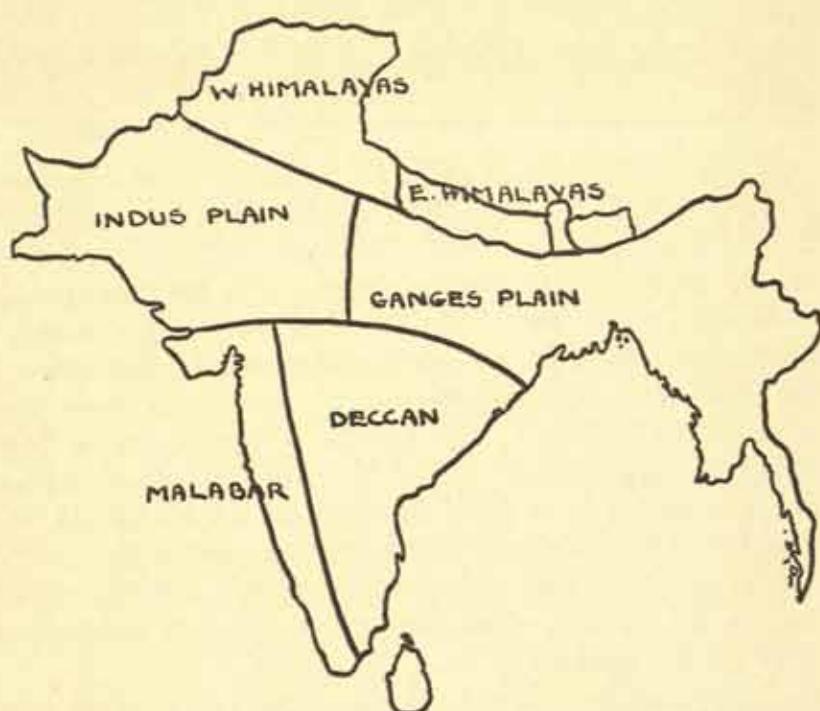
This book is not concerned with the scientific study of plants or with the botanical forms of flowers and leaves but with those trees and shrubs, which, by the beauty of their appearance or the familiarity of their names, lead visitors and residents to search for further information. It is for those people, residents or visitors—ordinary people with little or no knowledge of botany but with a love of beauty and an interest in this country—that these pages have been written. The first consideration throughout has been easy identification. A colour key is provided so that, with the knowledge of only a flower, a plant may be identified with a minimum of trouble. The few botanical terms, without which it was impossible to give clear descriptions, are explained or illustrated. There is no doubt that such a book as this will not appeal to the scientific botanist who may say in criticism that the descriptions are not in accordance with scientific works on flora, but it is not for such people that the book is intended. Essentially it is for the layman.

Not being a botanist myself I see trees with the eyes of a layman and as I see them so I have described them. India is so rich in flowers—there are hundreds of trees and shrubs from which I had to make my list—the trouble was what to leave out and not what to put in. So, again, there will no doubt be criticisms of my choice and I can only say that, with due consideration for the size of book required, I chose those which, to me, seemed most prominent.

Since one picture is worth a thousand words, the illustrations were all done with special care and from life, those in colour being painted natural size. A three-inch scale is marked at the bottom of each so that, even when reduced, the actual size of flowers and leaves can readily be determined. In some cases the tree sketches have been simplified so as to give a clearer idea of form and growth. Preparing this book has given me abundant pleasure and it is my hope that those nature-lovers who, by its aid, have found pleasure in identifying the trees and shrubs they have come across, will have had their botanical appetites sufficiently whetted for them to desire a further pursuance of the subject.

Some knowledge of the origin of Indian flora is desirable for a greater appreciation of its teeming growths. Reference to the *Encyclopædia Britannica*

tells us that the flora of India, Burma and Ceylon has no peculiar botanical features, being compounded of those of adjoining countries. Dividing India roughly into six parts, we have, firstly, the Western Himalayas consisting of parallel snow-clad mountains which show European and Siberian influence, especially at the higher levels. Secondly, the Eastern Himalayas, where tropical forms are more numerous and Chinese plants are in evidence. Next, the Indus plain which is arid over the greater part and has a very low rainfall. Here there is only scanty vegetation—mainly herbaceous and drying up in the hot season : low, thorny species are predominant. Fourthly, the Ganges plain



which is much more humid and therefore has a greater variety of plants. Then the Malabar area—from Gujarat to Travancore—where the greatest profusion of tropical plants is found—luxuriant and evergreen as in Malaya. Cane and bamboo are widespread; Teak, Queens flower and Fig trees grow in number and to fine proportions. Lastly the Eastern area—the belt of dry-evergreen, low jungle along the coast, where Ixoras are common—and the inland region of the Deccan where plants are deciduous and frequently thorny. There, *Convolvulus*, Bamboo, varieties of *Sterculia*, the Indian Laburnum, Palmyra and Date palms are common. From this brief survey the reader will get an idea which districts are included or excluded in reference to the distribution of a tree or shrub.

In no country are plants used medicinally to the extent they are here. Few trees or shrubs are not useful in this respect and many offer healing qualities in their flowers, leaves, fruit, bark and roots. A number of the treatments prescribed for centuries by herbalists and medicine men have been

proved to be of real benefit to the patient, but others can be classed among "Old Wives' Tales" and if recoveries have been achieved it has been by good luck and persuasion. Medical authorities have proved that the numerous prescriptions offered as a cure for snake-bite or scorpion sting are, in fact, quite useless.

Selecting names has presented a great difficulty. In the numerous books of reference which I have studied each, frequently, give a different English name for the same plant; those which give vernacular names are at great variation in some instances and more recent productions give revised Latin names. So I decided to include all the English names, both Latin names and to select only some of those vernacular names on which different works agreed. It has not been possible for me to make any check on local names except those used in Bombay.

I would like to express full acknowledgment for the information gleaned from the following authorities: Messrs. Watt, Hooker, Brandis, Roxburgh, Blatter and Mallard, Talbot, Oliver, Gamble and Parker.

I also owe a debt of gratitude to those who have so kindly helped and encouraged me, especially Mr. Joseph Abraham for correcting the script, Mr. Ahhmadi and Mr. Ressurriecas of the Victoria Gardens, Mr. Castellino of the Willingdon Club and Major E. Holmes, for their kind co-operation.

D. V. C.

CONTENTS

	<i>Page</i>
<i>List of Illustrations (Plates)</i>	xi
<i>List of Illustrations (Sketches in Black-and-White)</i>	xii
<i>Colour Key</i>	xiii

TREES AND PALMS

1. GUL MOHR	1
2. FLAME OF THE FOREST	3
3. ASOKA	5
4. RED SILK COTTON	6
5. WILD ALMOND	9
6. JACARANDA	12
7. JAVA PLUM	13
8. NIM	15
9. TEAK TREE	17
10. TEMPLE TREE	19
11. BAOBAB	21
12. MOUNTAIN EBONY	23
13. CORAL TREE	25
14. QUEEN'S FLOWER	28
15. PINK CASSIAS	29
16. BELLERIC MYRABOLAN	33
17. MANGO	35
18. RAIN TREE	37
19. JACK FRUIT TREE	39
20. TULIP TREE	43
21. RIO GRANDE TRUMPET FLOWER	45
22. TAMARIND	47
23. CORK TREE	49
24. PONGAM	51
25. INDIAN LABURNUM	52
26. RUSTY SHIELD BEARER	55
27. CASUARINA	57
28. LIGNUM VITÆ	60
29. BABUL	62
30. BANYAN TREE	63
31. PEEPUL	65
32. MADRE	67
33. DRUMSTICK TREE	69
34. BEAD TREE	70
35. UMBRELLA TREE	71

CONTENTS

	Page
36. MOHWA	73
37. EASTER TREE	75
38. SCARLET CORDIA	76
39. INDIAN JUJUBE	77
40. MAST TREE	79
41. PAPAYA	81
42. BANANA TREE	83
43. COCONUT	87
44. PALMYRA	90
45. FISH-TAIL	92
46. ROYAL	94
47. WILD DATE	96
48. ARECA	98

SHRUBS AND CREEPERS

1. GOLDEN DEWDROP	102
2. OLEANDER	103
3. PEACOCK FLOWER	104
4. PAPER-CHASE TREE	105
5. BOUGAINVILLEA	106
6. LANTANA	108
7. CAMPHIRE	109
8. IXORA	110
9. HIBISCUS	112
10. YELLOW OLEANDER	114
11. RANGOON CREEPER	115
12. POINSETTIA	116
13. CORAL CREEPER	117
14. MOONBEAM	118
15. PURPLE WREATH	119
16. GOLDEN SHOWER	120
17. RED BELL BUSH	121
18. TREE OF SORROW	122
19. YELLOW ELDER	123
20. RAILWAY CREEPER	124
21. GLORY LILY	126
22. HEAVENLY BLUE	127
23. WILLOW-LEAVED ALLAMANDA	128
<i>Glossary</i>	129
<i>Index to English and Scientific Names</i>	131
<i>Index to Indian Names</i>	135

LIST OF ILLUSTRATIONS: PLATES

1.	FLAME OF THE FOREST	facing page	3
2.	GUL MOHR	"	3
3.	ASOKA	"	5
4.	SILK COTTON	"	6
5.	WILD ALMOND	"	11
6.	JACARANDA	"	12
7.	NIM	"	14
8.	JAVA PLUM	"	14
9.	TEMPLE TREE	"	20
10.	VARIEGATED BAUHINIA AND PURPLE BAUHINIA	"	23
11.	CORAL TREE	"	26
12.	QUEEN'S TREE	"	29
13.	PINK CASSIAS	"	29
14.	BELLERIC MYRABOLAN	"	35
15.	MANGO	"	35
16.	RAIN TREE	"	38
17.	TULIP TREE	"	43
18.	RIO GRANDE TRUMPET FLOWER	"	46
19.	TAMARIND	"	46
20.	PONGAM	"	51
21.	CORK	"	51
22.	RUSTY SHIELD BEARER	"	52
23.	LABURNUM	"	61
24.	LIGNUM VITÆ	"	62
25.	BABUL	"	62
26.	BANYAN	"	68
27.	MADRE	"	69
28.	DRUMSTICK TREE	"	70
29.	BEAD TREE	"	71
30.	UMBRELLA TREE	"	74
31.	MOHWA	"	75
32.	EASTER TREE	"	76
33.	SCARLET CORDIA	"	77
34.	MAST TREE	"	77
35.	JUJUBE	"	102
36.	GOLDEN DEWDROP	"	103
37.	OLEANDER	"	104
38.	PEACOCK FLOWER	"	105
39.	PAPER-CHASE TREE	"	106
40.	BOUGAINVILLEA	"	110
41.	IXORA	"	110
42.	HIBISCUS	"	107
43.	LANTANA	"	107
44.	CAMPHIRE	"	114
45.	YELLOW OLEANDER	"	115
46.	RANGOON CREEPER	"	116
47.	POINSETTIA	"	117
48.	CORAL CREEPER	"	118
49.	MOONBEAM	"	119
50.	PURPLE WREATH	"	

51. GOLDEN SHOWER	facing page	119
52. TREE OF SORROW	"	122
53. RED BELL BUSH	"	122
54. YELLOW ELDER	"	123
55. MORNING GLORY AND RAILWAY CREEPER	"	123
56. CRIMSON IPOMEA	"	124
57. GLORY LILY	"	125
58. ALLAMANDA	"	126
59. HEAVENLY BLUE	"	128
	"	128

SKETCHES IN BLACK-AND-WHITE

	Page
1. GUL MOHR	1
2. FLAME OF THE FOREST IN FLOWER	4
3. SILK COTTON IN FLOWER	7
4. LEAVES OF SILK COTTON	8
5. WILD ALMOND	8
6. JAVA PLUM	10
7. NIM TREE	14
8. YOUNG TEAK IN FLOWER	16
9. TEMPLE TREE IN FLOWER	18
10. BAOBAB IN FRUIT	20
11. CORAL TREE IN FLOWER	21
12. BURMESE PINK CASSIA IN FLOWER	26
13. MANGO	30
14. RAIN TREE	36
15. JACK FRUIT TREE WITH FRUIT	37
16. JACK FRUIT TWIG WITH MALE RECEPTACLE	40
17. TULIP TREE IN FLOWER	41
18. RIO GRANDE TRUMPET FLOWER	44
19. TAMARIND	46
20. CORK TREE	48
21. INDIAN LABURNUM IN FLOWER	50
22. RUSTY SHIELD BEARER	53
23. YOUNG CASUARINA	55
24. CASUARINA TWIG	58
25. LIGNUM VITÆ	59
26. TRUNK OF BANYAN	60
27. LEAVES AND FIGS OF PEEPUL TREE	64
28. SPOTTED GLIRICIDIA IN FLOWER	66
29. UMBRELLA TREE	67
30. MOHWA	71
31. MAST TREE	74
32. PAPAYA	79
33. BANANA	82
34. COCONUT PALM	84
35. PALMYRA PALM	88
36. FISH-TAIL PALM	91
37. ROYAL PALM	93
38. DATE PALM	95
39. BETEL-NUT PALM	97
	99

COLOUR KEY FOR TREES AND SHRUBS
(EXCLUDING PALMS)

NOTE.—A large flower is $1\frac{1}{2}$ inches or more across.

1. Red, Scarlet and Orange Flowers :

(a) Large Flowers

A TREES	(1) leafless	.. (i) single	Silk Cotton
		(ii) spikes	Coral Tree
		(iii) sprays	Flame of the Forest
		(iv) clusters	Temple Flower variety
	(2) in leaf	.. (i) sprays	Gul Mohr
		(ii) clusters	Scarlet Cordia
	(b) Small Flowers		Tulip Tree
	(1) leafless	.. (i) spikes	Frangipanni
		(ii) sprays	<i>Sterculia colorata</i>
	(2) in leaf	.. (i) within fruit	Wild Almond
		(ii) heads	<i>Sterculia villosa</i>
			Banyan
			Peepul
			Asoka

B SHRUBS	(a) Large Flowers	.. (i) single	Hibiscus
		(ii) clusters	<i>Tecoma capensis</i>
		(iii) sprays	Peacock Flower
		(iv) bracts	Poinsettia
	(b) Small Flowers	.. (i) heads	Bougainvillea
		(ii) single	Ixora
		(iii) clusters	Lantana
			Red Bell Bush
			Paper-chase Tree
			<i>Mussaenda corymbosa</i>

C CREEPERS	(a) Large Flowers	.. clusters	Crimson Ipomea
	(b) Small Flowers	.. (i) single	Glory Lily
		(ii) clusters	Golden Shower
			Rangoon Creeper

2. *Yellow Flowers*:

A TREES	{	(a) Large Flowers .. (i) single	Yellow Silk-cotton
		(ii) sprays	Umbrella Tree
B SHRUBS	{	(b) Small Flowers .. (i) heads	Indian Laburnum
		(ii) spikes	<i>Bauhinia tomentosa</i>
C CREEPERS	{	(iii) sprays	Flame of the Forest variety
		(a) Large Flowers .. (i) single	Babul
C CREEPERS	{	(ii) clusters	Rusty Shield Bearer
		(iii) sprays	Tamarind
C CREEPERS	{	(b) Small Flowers .. (i) spikes	Hibiscus
		(ii) heads	Yellow Oleander
C CREEPERS	{	(iii) clusters	Yellow Elder
		(a) Large Flowers .. single	Peacock Flower
C CREEPERS	{	(i) single	Camphire
		(ii) sprays	Ixora
C CREEPERS	{	(iii) clusters	Lantana
		(i) single	<i>Mussaenda erythrophylla</i>
C CREEPERS	{	(ii) sprays	<i>Mussaenda luteola</i>
		(iii) clusters	Allamanda

3. *Pink Flowers*:

A TREES	{	(a) Large Flowers ..	spikes	Queens Flower
		(b) Small Flowers ..	(i) fluffy groups (ii) sprays	Rain Tree Pink Cassia
B SHRUBS	{	(a) Large Flowers ..	(i) single (ii) clusters	Hibiscus <i>Ipomea carnea</i> Oleander
		(b) Small Flowers ..	(i) heads (ii) sprays	Ixora Lantana Indian Lilac
C CREEPER	{	Small Flowers ..	(i) sprays (ii) clusters	Coral Creeper Rangoon Creeper

4. *Blue, Mauve or Purple Flowers:*

A TREES	$\left. \begin{array}{l} (a) \text{ Large Flowers} \dots \text{(i) single} \\ \text{Leafless} \dots \text{(ii) spikes} \\ \dots \text{sprays} \\ (b) \text{ Small Flowers} \dots \text{(i) clusters} \\ \text{(ii) sprays} \end{array} \right\}$	Rio Grande Trumpet Flower
		Queens Flower
		Mountain Ebony
		Geranium Tree
		Lignum Vitæ
		Madre
		Jacaranda
		Bead Tree

B SHRUBS	$\left. \begin{array}{l} (a) \text{ Large Flowers} \dots \text{single} \\ (b) \text{ Small Flowers} \dots \text{sprays} \end{array} \right\}$	<i>Allamanda violacea</i>
		Golden Dewdrop

C CREEPERS	$\left. \begin{array}{l} (a) \text{ Large Flowers} \dots \text{(i) single} \\ \text{(ii) clusters} \\ (b) \text{ Small Flowers} \dots \text{sprays} \end{array} \right\}$	Heavenly Blue
		Morning Glory

5. *Pale Green Flowers:*

A TREES	$\left. \begin{array}{l} \text{Small Flowers} \dots \text{(i) sprays} \\ \text{(ii) in receptacles} \\ \text{(iii) clusters} \end{array} \right\}$	Mast Tree
		<i>Sterculia urens</i>
		<i>Sterculia alata</i>

Jack Fruit

Indian Jujube

6. *White or Cream Flowers:*

A	
TREES	
(a) Large Flowers . .	(i) single
	(ii) sprays
	(iii) fluffy groups
	(iv) clusters
	(v) spikes
(b) Small Flowers . .	(i) sprays
	(ii) single
	(iii) tassels
	(iv) clusters
	(v) spikes

B SHRUBS	(a) Large Flowers ..	(i) single	Hibiscus
		(ii) clusters	Moonbeam
	(b) Small Flowers ..	(i) heads	Oleander
		(ii) clusters	Ixora
		(iii) spikes	Tree of Sorrow
		(iv) sprays	Camphire
		(v) bracts	<i>Duranta ellisii</i> Indian Lilac Paper-chase Tree

C CREEPERS	(a) Large Flowers ..	single	Heavenly Blue variety
	(b) Small Flowers ..	sprays	Moon Flower Coral Creeper

TREES
AND
PALMS

GUL MOHR, PEACOCK FLOWER or FLAMBOYANT

POINCIANA REGIA or *DELONIX REGIA*

Sunkesvara (Vern.) ; *Mayarum* (Tam.) ; *Shima Sankesula* (Tel.)



THE Gul Mohr is one of our most striking ornamental trees and each April one cannot help but wonder how a bare, gaunt tree, standing in dry, hard earth can produce such a wealth of glorious bloom. Within a week of the first blossom appearing, the whole tree is sparkling with vivid splashes of crimson and orange. In May the pale, rich green of the new foliage unfolds and the tree develops a feathery grace. Bare, grey branches and long, ugly, black pods are all hidden and the spreading canopy of green lace and scarlet blossoms is at its loveliest. There is a wealth of variety in the shades of crimson and scarlet, some being almost orange and others a deep, deep red. Each have their admirers.

The large flower-sprays bear numerous, intermingling blooms and roundish, nodding buds. Individually each flower will be seen to be about 5 inches across. Five thick, crimson sepals curve back to display their lime-green lining and bright yellow rims. From the spaces between them, radiate the five spoon-shaped, wavy and crinkle-edged petals ; one of them is larger, its white or yellow centre streaked and splashed with scarlet. Ten long stamens spread and curve from the centre. After the fall of the flowers the soft, green pods make their appearance ; soon they become hard and black—long ugly tubes hanging amongst the leaves. They remain there throughout the season—even until the flowers of the following year appear.

The long bipinnate leaves are not unlike those of several other trees—each pinna bearing from twenty to thirty tiny oblong leaves, giving a graceful, feathery aspect to the tree. Even when the Gul Mohr is flowerless it can easily be recognised by the smooth, grey limbs and the characteristic formation of outward spreading branches and leaves. There is no depth to the foliage ; from below there seems to be but one layer of leaves—an umbrella of lace.

Gul Mohrs make excellent light-shade trees and are frequently planted in avenues, where, if every tree is about the same height, they form a splendid vista. During the first weeks of flowering such an avenue is a joy to behold, but after some weeks we turn our eyes in relief to the softer pastel shades of the Queens Tree and the Jacaranda. The strident scarlet has begun to pall !

There is some controversy over the meaning of the name of this popular tree. There are those who say the word is Mohr, meaning "peacock," while Gul is a flower. Others claim that the word is Mohur, a coin. But it is generally agreed that the name Gold Mohur is incorrect. Perhaps the most attractive of its names are those given by the French—*Fleur de Paradis* and *Flamboyant*. The botanical appellation is in honour of M. de Poinci, 17th Century Governor of the Antilles, from where the plant was first brought. Now it is to be found in most tropical countries.







GUL MOHR



FLAME OF THE FOREST

THE FLAME OF THE FOREST or PARROT TREE

BUTEA FRONDOSA or *B. MONOSPERMA*

Dhak or *Palas* (Hindi); *Porasum* (Tamil); *Khakda* (Gujerati).

THE Flame of the Forest is a medium sized tree, growing from 20 to 40 feet high, and the trunk is usually crooked and twisted with irregular branches and rough, grey bark. It is seen in all its ugliness in December and January when most of the leaves fall : but from January to March it truly becomes a tree of flame, a riot of orange and vermillion flowers covering the entire crown. These flowers, which are scentless, are massed along the ends of the stalks—dark, velvety green like the cup-shaped calices—and the brilliance of the stiff, bright flowers is shown off to perfection by this deep, contrasting colour. Each flower consists of five petals comprising one standard, two smaller wings and a very curved beak-shaped keel. It is this keel which gives it the name of Parrot Tree. The back-curving petals are covered with fine, silky hair, which, seen at certain angles, change the deep orange to a silvery salmon-pink. The buds too, have this downy growth and acquire a beautiful mauvish bloom.

The leaves, which appear in April and May, are large and trifoliate. When fresh they are like soft suede ; thick, velvety and a beautiful pale, bronze green. Old leaves are as firm and tough as leather, smooth above and hairy below. This silky down gives them a silvery appearance from a distance.

The pods, when young, are pale green, are covered with a dense growth of fine hair and sometimes give the effect of a tree in full leaf. They are pendulous and 3 to 4 inches long. When ripe they become yellow-brown and contain flat, brown seeds.

That the flowers contain much nectar is evidenced by the frequent visits of many species of birds ; sunbirds, mynahs and babblers are usually to be seen, hurrying from flower to flower, chattering and twittering. With man, also, the tree is very popular, having numerous uses. From an infusion of the flowers a brilliant colouring matter can be obtained, which may be made into water-paint or into a dye. Cotton, prepared with alum, can be dyed a bright yellow or orange.

From the seeds a clear oil is obtained and the gum which exudes from the stems, known as Bengal Kino, is valuable to druggists because of its astringent qualities, and to leather workers because of its tannin. Young roots make a strong fibre which has many uses, the making of rope sandals being one of the most important. Roots, eaten raw, cause giddiness, but, baked, are eaten by Mundari children. The leaves, because of their strength, are sewn together by poor people to make plates and the lovely flowers are popular with all Indian women for adornment of their hair.



The Palas is sacred to the moon and is said to have sprung from the feather of a falcon impregnated with the Soma, the beverage of the Gods, and thus immortalised. It is used in Hindu cremonies for the blessing of calves to ensure their becoming good milkers. When a Brahmin boy becomes a Sadhu, his head is shaved and he is given a Palas leaf to eat—the trifoliate formation representing Vishnu in the middle, Brahma on the left and Shiva on the right.

A rare yellow variety of the Flame of the Forest is sometimes found in India.

Butea Frondosa is named after the Earl of Bute, a patron of Botany and *Frondosa*, meaning "leafy". It is a native of India but is not found in the driest parts, being most common in Central India and the Western Ghats.



D.Y. COWEN

INS:

ASOKA

ASOKA

SARACA INDICA

Asok (Hind.); *Asok, Ashoka, Asogam* (Tam.)

THE origin of the name *Saraca indica* is doubtful and it can hardly be claimed to be an improvement on the old one of *Jonesia asoka*, given by Indian botanists to honour Sir W. Jones "the most enlightened of the sons of men," who himself expressed the wish that the tree should retain the old Sanskrit name *Ashoka*.

Indigenous to India, Burma and Malaya, it is an erect tree, small and evergreen, with a smooth, grey-brown bark. The crown is compact and shapely.

Flowers are usually to be seen throughout the year, but it is in January and February that the profusion of orange and scarlet clusters turns the tree into an object of startling beauty. Pinned closely on to every branch and twig, these clusters consist of numerous, small, long-tubed flowers which open out into four oval lobes. Yellow when young, they become orange then crimson with age and from the effect of the sun's rays. From a ring at the top of each tube spread several long, half-white, half-crimson, stamens which give an hairy appearance to the flower clusters. In strong contrast to these fiery blooms is the deep-green, shiny foliage. The foot-long leaves each have four, five or six pairs of long, wavy-edged, leaflets. Young leaves are soft, red and limp and remain pendent even after attaining full size.

The straight or scimitar shaped pods, stiff, leathery, broad and about eight inches long, are red and fleshy before ripening.

As one would expect from a tree of the country it has many useful medicinal properties. The juice obtained from boiling the bark is a cure for some ailments of women, and a pulp of the blossoms is one of the remedies used for dysentery.

As it is believed that Sakyamuni, the founder of the Buddhist religion and doctrine of *Nirvana* was born under an Asok tree in the 9th Century B.C. the tree is worshipped by all Buddhists. Hindus also revere it because to them it is the symbol of love and dedicated to Rama. Sita, wife of Rama, when abducted by the evil Ravanna was kept in a garden among groves of Asoka trees. Both Buddhists and Hindus plant the tree round their temples and the blossoms are among those used for religious offerings.

On Ashok Shasthi day, women from Bengal eat the flower buds, while Hindu ladies believe that by drinking the water in which flowers have lain, they will protect their children from worry and grief.

There is a quaint Indian belief that trees will only flower in places where a woman's foot has trod and another which asserts that a tree will bloom more vigorously if kicked by a young lady !

THE RED SILK COTTON

BOMBAX MALABARICUM or *GOSSAMPINUS MALABARICUM*
or *SALMALIA MALABARICA*

Sawar (Guj.) ; *Simal* (Hind.) ; *Ilavu* (Tam.) ; *Khuttian* (Vern.).

THE Red Silk Cotton, a tall, handsome tree, is found all over India and Burma, except in the driest areas, and is particularly common in the Konkans. The straight, ashy trunk is often buttressed to support the heavy crown and the prickle-covered, horizontal branches, are usually arranged in twos or threes around the main stem, in a whorled formation.

Towards the end of the year, or even as late as March in moist localities, the leaves wither and fall, leaving the tree gaunt and naked until, in January or February, small swellings appear on the wrinkled twigs. These quickly develop into strong, heavy buds, pinkish-purple in colour and with a plum-like bloom. The large flowers grow in groups and cling closely to the rugged branchlets. From the short, thick stalk and cup-shaped calyx, curl the five broad, fleshy petals, brilliant scarlet and glossy. Faint veins etch each petal from base to tip. The conspicuous stamens, more than sixty in number, grow in a wide circle of five unequal bunches and a central bunch of fifteen. They are golden at the base then, merging into red, are tipped with small black anthers. Light scarlet and even pink flowers are found, all alike in their shining flamboyance. While still fresh the flowers fall to the ground and are often eaten by deer. Village folk too, consider them edible.

No tree attracts birds to quite the extent of the Silk Cotton. There is a constant chatter of bird voices from every tree in bloom. Crows, bul-buls, mynahs, rosy pastors, sunbirds, flower-peckers and many others squabble and jostle for a sip of the delicious nectar. All this activity, of course, means that every flower is fertilised.

In April, the well-known fruit can be seen, first as big, green fingers pointing in all directions ; then later, brown and brittle and split to their base by the bursting, fluffy cotton which, freed from its confinement, floats down to earth, carrying with it the small, black seeds. At this time the tree becomes an odd sight. It appears to be draped with cotton wool and for some distance around the base lie scattered fragments of floss. This is too short and soft to be spun, but can be made into tinder and is widely used for stuffing pillows and cushions.

Mocharas, a brown, astringent gum, is obtained from the Silk Cotton and is frequently found in Indian bazaars.

During the monsoon and until the end of the year the Silk Cotton makes a good shade tree, well covered with fresh green, spreading leaves. These are in "hand" formation, each of the three to seven leaflets about 6 inches in length,



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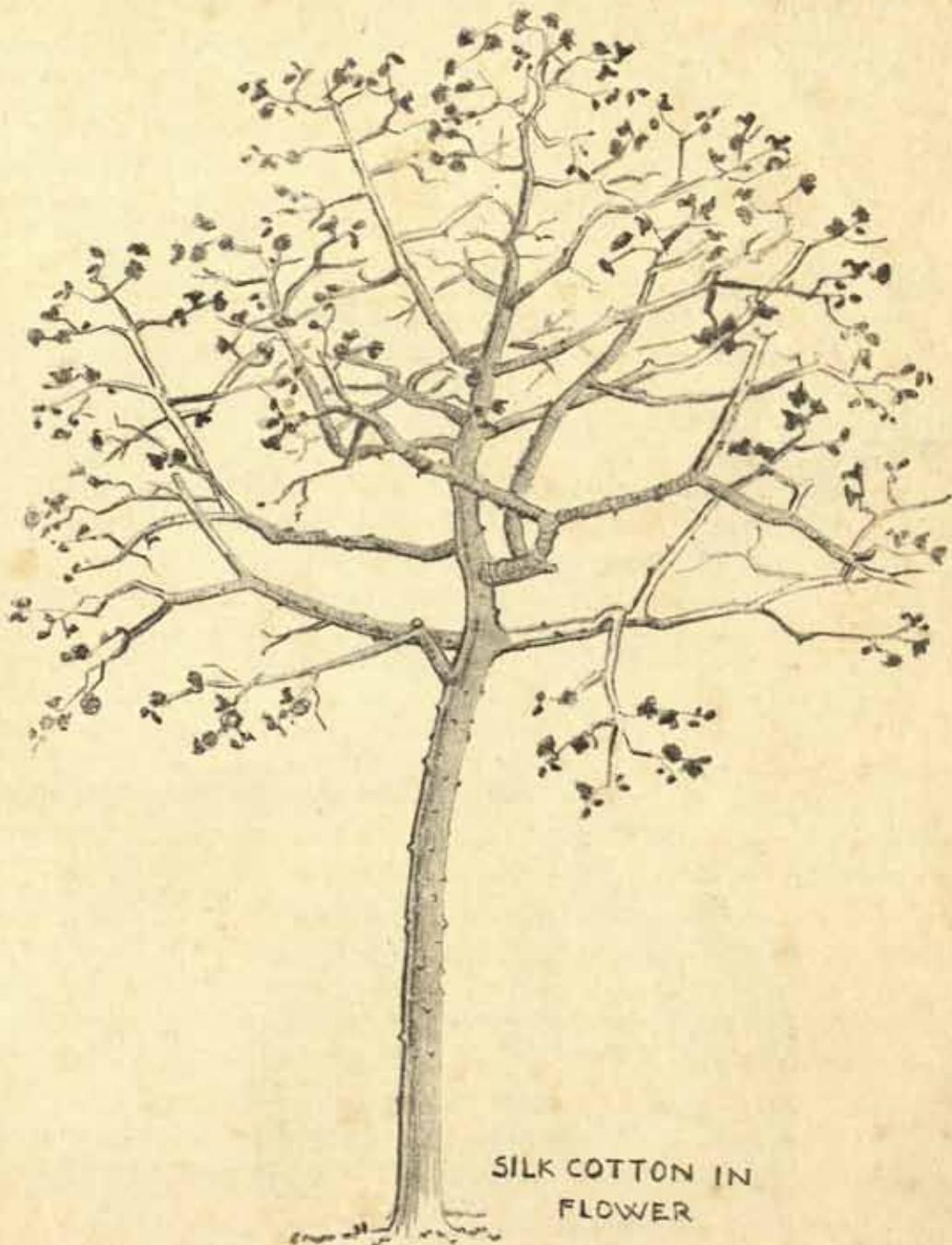
D. COWEN

SILK COTTON

oblong, pointed at each end and with the apex point slightly elongated. At this time of the year the tree can be recognised by the horizontal prickly branches and the rather unusual shape of the leaves.

Bombax is from the Greek word *Bombux*, a silk-worm and *malabaricum* means from Malabar.

A tree which is very similar to the Red Silk Cotton and often mistaken for it is *Gossampinus insignis*, also known as *Simal* or Silk Cotton. The leaflets are narrower and often greater in number, the fruit is longer and angled, the petals are longer and narrower and, most important of all, the stamens are in bundles of fifty or more and completely fill the cup of the carolla.



The White Silk Cotton (*Eriodendron anfractuosum*) known as *Safed simal*, is similar in leaf and general growth but the flowers, which appear in February, are a dirty white and hang in clusters. The fruit is filled with masses of wool floss and is the familiar, commercial Kapok used for pillow and mattress filling. Many lives were saved during the war by the excellent Kapok-filled life-belts provided by all ships. The tree also has many medicinal and economic uses.

The Yellow Silk Cotton or Torchwood Tree (*Cochlospermum gossypium*) and *Kumbi* in the vernacular, is found mostly in dry, hilly districts, thriving in the hottest and stoniest places. It is therefore all the more astonishing that in March, it is able to put forth such a magnificent display of large golden blooms. These cluster at the end of the dark, naked branches—a brilliant contrast! Leaves soon follow flowers and, covering the numerous branches, form a heavy crown. Like the other Silk Cottons, the seeds are contained in masses of silky floss which, during the May winds, are carried considerable distances.



WILD ALMOND *or* POON TREE

STERCULIA FÄTIDA

Jungli Badam (Bengal); *Kudrapdukku, Pinari* (Tamil).

THERE are many species of *Sterculia*, most of them erect, handsome trees, but having a variety of leaf-shape. The flowers, too, vary; some are large and attractive, others small, even insignificant; some sweet-scented, others strong-smelling to the extent of being offensive. They are related to the Silk Cottons and, with them, bloom in the early part of the year, sometimes before the new leaves appear.

The Wild Almond (*Sterculia fætida*) is a tall, straight, noble tree, transcendent in the fresh, full leafage of March and April. Originally from East Africa and North Australia, it grows freely down the West of the Peninsular, in Burma and Ceylon.

The grey bark is smooth, spotted with brown and faintly ridged. At certain times of the year patches of bark loosen and fall away, which impairs the appearance of the tree. The branches are whorled and usually horizontal, the numerous branchlets gracefully up-curved and crowded at the ends with large, digitate leaves, remind one somewhat of the English Horse-chestnut. The flowers, however, bear no resemblance at all to this tree. Appearing early in February, they form at the knotty ends of the wrinkled old branchlets, immediately beneath the new leaves and spread in drooping rays as much as one foot in length. The reddish-green stems bear numerous short branched stalks, each terminating in a crimson-brown flower. The calices, in appearance like petals, of which there are none apparent, are about $\frac{3}{4}$ -inch across, five-sepalled, back-curling and varying in colour from yellow to pale terracotta and to deep crimson and brown. But the main characteristic of these flowers is their incredible stench. Coming across a Wild Almond in bloom ones first thoughts would be that one was near an open sewer and any part of the tree when bruised or cut emits this unpleasant odour. It is unfortunate as the tree is extremely handsome; tall and straight, its well shaped crown swathed in coral, often without a single touch of green, it stands out amongst the surrounding verdure in great beauty and dignity.

The leaves which spring in groups of about seven from the ends of the branchlets are born on long stalks and consist of from five to seven 6-inch leaflets issuing from a central point—a hand-like formation. Young leaves are a rich, pale green, slightly downy and from them a green dye may be obtained.

By March no more flowers are to be seen and the tree is crowned with an abundance of fresh green, drooping leaves. In April the fruit clusters become very conspicuous, looking like odd, black objects casually thrown into

the tree. Each nut as large as a man's fist, they are dark, smooth and boat-shaped, woody in texture and eventually burst open into four sections. The many filbert-sized, black seeds are roasted and eaten like chestnuts, but if taken raw and in excess they bring on nausea and vertigo.





115.

D. COWEN

WILD ALMOND

Leaves and bark have considerable medicinal value. The wood is pale, lasting and does not split; it furnishes some of the masts known as "poon spars."

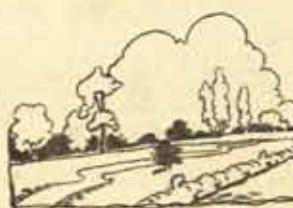
The inodorous nature of the tree is emphasised in its name—*Sterculia* being from a word meaning "dung" and *fætida* meaning "stinking"!

S. urens is a fairly common variety bearing, in February and March, small, greenish-yellow flowers, hirsute and sticky. The leaves are hand-shaped and similar to those of the previous tree. In Hindi it is known as *Gulu*, in Marathi as *Karai* and in Tamil as *Kavali*.

S. villosa flowers at the same time and has long tresses of small, yellow and scarlet blossoms. Its fruit is large, red and downy. The bark is easily stripped and employed in the making of bags and ropes. It makes the common rope used by elephant hunters in the Himalayas and elsewhere. Its Hindi name is *Udar, Arni* in Tamil.

S. alata, *Tula* in Bengal, is another variety, popular for roadside planting and conspicuous when in fruit as the huge, wooden nuts are often more than 6 inches in diameter. The dull green, fragrant flowers appear about March.

A fourth variety is *S. colorata*, *Bodala* in Hindi, *Bhai-koi* in Bombay and *Kowsey* in Marathi, which loses its leaves in the cold season and in March produces on the bare branches numerous, erect spikes of small, orange-red blossoms and buds. The leaves, which appear shortly after, are broadly lobed, each lobe narrowing to a point. The seeds are displayed before ripening as the pink fruit opens out flat—appearing rather like dry leaves.



THE JACARANDA

JACARANDA MIMOSAFOLIA

It is difficult to understand why such a beautiful tree as the Jacaranda is not more widely cultivated. It is one of our loveliest garden trees, both the flowers and leaves having a definite charm of their own. In the North-West it has been fairly freely planted as it propagates easily in the sandy soil, but elsewhere it is all too rare. It is a native of Brazil and has been introduced into many tropical and sub-tropical countries. It is a handsome tree of medium height—60 feet at the most—with big leaves divided into such tiny segments that the whole has the finely cut appearance of a fern. Each little leaflet is a pointed oblong and, at the end of each *pinna* is a leaflet slightly larger than the others.

The flowering season is from March to May and, unfortunately, does not last very long. An avenue of these trees such as one sees up-country is an unforgettable sight when, from end to end every tree is swathed in blue. In Bombay the season is extended because one tree will start flowering when its neighbour has finished. Fresh green stems growing from the old wood terminate in large, loose clusters of deep blue-mauve flowers, sometimes as many as ninety in one glorious spray. Each flower is a long, bent, swelling tube, rather the shape of a foxglove flower. It is about 2 inches long and divides into five unequal lobes, two up-curving and smudged with white and the other three large and straight. The fruit, which does not appear in anything like the profusion of the flowers, is a round, flat capsule about 2 inches across, bearing numerous seeds.

The Pink Cassias are flowering when the Jacaranda blooms and the two colours side by side make a lovely combination.

In Columbia this tree has medicinal uses, but here it apparently is not sufficiently well established for the herbalists and village doctors to have learnt of its value.

The name *Mimosafolia* means having leaves like the Mimosa tree, but I imagine the tree described by Mr. Otto Degener in the Journal of the New York Botanical Gardens as *Jacaranda acutefolia*, to be the same. He says “The acute-leaved Jacaranda has been introduced . . . , usually under the wrong scientific name. Even the common name Jacaranda is seldom pronounced correctly. It comes from Brazil, where the literates speak largely Portuguese and in that language the letter “j” is pronounced like the “z” in “azure,” and in this word the last vowel is accented.”



BY COWEN

INS:

JACARANDA

JAVA PLUM or INDIAN ALSPICE

EUGENIA JAMBOLANA or *SYZYGIUM CUMINI*

Jaman (Hind.) ; *Naval* (Tam.) ; *Neredu* (Tel.) ; *Jambhul* (Mar.)

THE Java Plum is a tall, handsome tree when grown in suitable localities. Wild, it is found chiefly along river-beds and there it usually has a crooked stem and many branches. It is one of the common evergreen trees of India, Burma and Ceylon, except in the very arid districts and is grown for its shade and for the astringent fruit which is very palatable in tarts and puddings. In Mahabaleshwar it is common, but there appears like most of the other trees, gnarled and stunted.

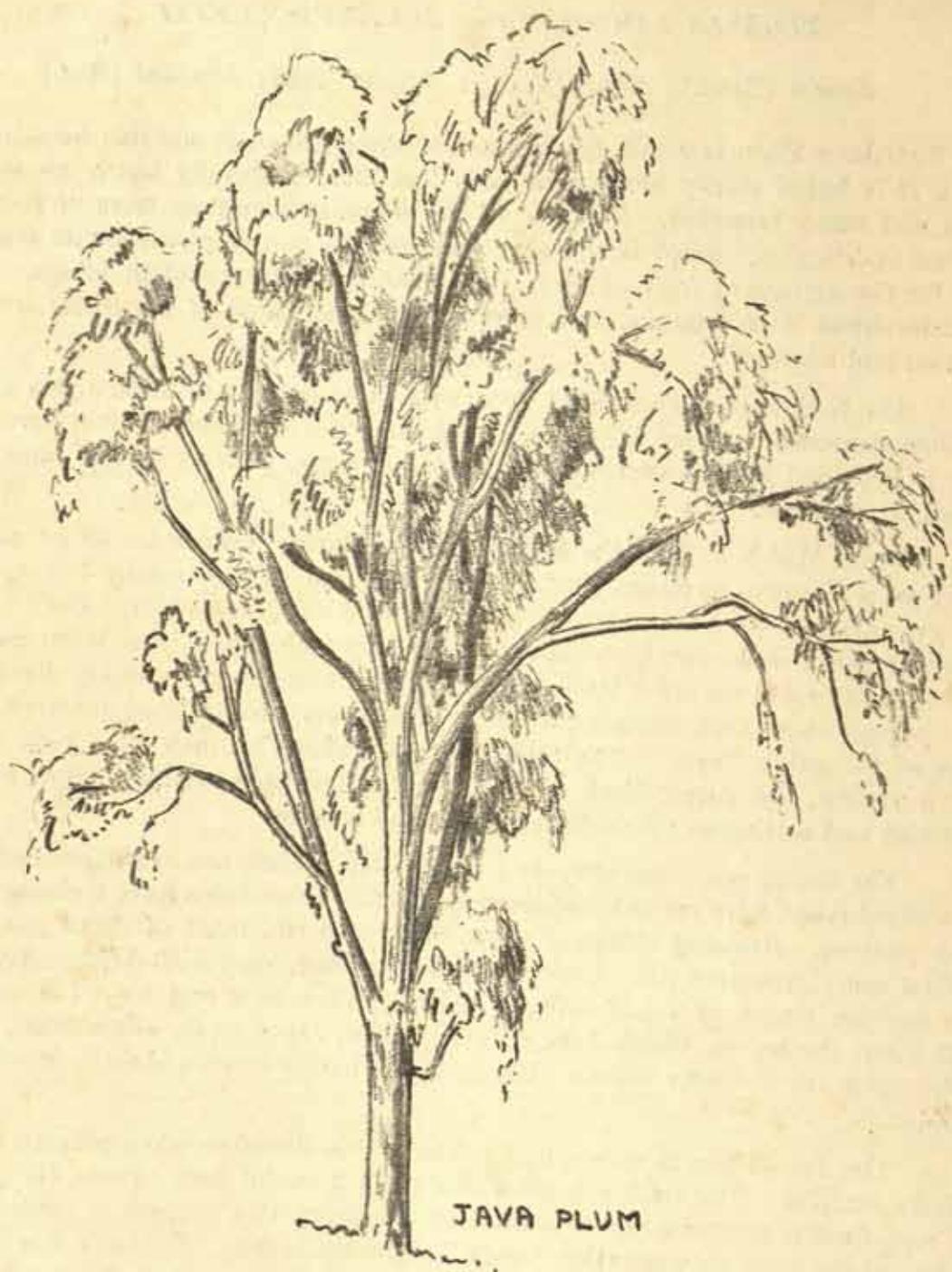
The bark is rough and light grey, with large patches of darker grey and shallow depressions where bark has peeled off. The elegance of a well-grown tree is provided by the sweeping branches and large, smooth leaves, most of which are pendent.

From March to May the inconspicuous, whitish flowers are to be seen. They grow in open, stemmed clusters from small side stems usually below the leaves, and for this reason are not apparent to a casual observer. Each tiny fragrant flower is like two little caps closed against each other. One is the calyx which remains and the other the petals, which are in one piece instead of divided. The upper "cap" falls, releasing a bunch of stamens which spread out over the edge of the calyx "cap." The little plums are about an inch long, pink and green at first, but purple-black when ripe. The red pulp is described as acid, sweetish and astringent ; it darkens the lips and tongue.

The leaves grow opposite, on 1 inch stalks. They are oval, terminating in a slight point, very smooth and closely veined. These veins have a characteristic pattern. Running obliquely from the centre rib, most of them join up with a wavy, marginal rib. Leaves, as also the fruit, vary with different trees ; the average length of a leaf being 3 inches. When new and for some weeks following, the leaves, which form a dense crown, are a fresh, clear green, but older ones are a deeper colour. Crushed, the leaves have a definite smell of turpentine.

The Java Plum is sacred to Krishna and is therefore often planted near Hindu temples. The timber is good and gives a useful fuel. From the juice of ripe fruit a spirituous liquor is distilled and from this vinegar is made. It is one of the trees on which the "tasar" silkworm is fed. The bark has been used in dyeing and tanning and is employed in medicine as a specific for dysentery. From the unripe fruit also, a remedy for this complaint is decocted.

The Latin name of the tree honours Prince Eugene of Savoy who was a patron of Botany in the 17th Century. *Jambolana* is from the Portuguese name of the tree.





JAVA PLUM



NIM TREE

THE NIM or MARGOSA TREE

AZADIRACHTA INDICA

Nim (Hind.) ; *Vepa* (Tam.) ; *Nimbay* (Mar.) ; *Yepa* (Tel.).

FAMILIAR to most people for its medicinal properties the Nim is recognised by few, in spite of its distinctive leaves and annual profusion of sweet-scented flowers. It is a medium-sized or large tree with a straight trunk, elegant in form and evergreen.

The flowers, which appear from March to May, are tiny stars borne in great number on long, drooping stems which spring from the axils of the leaves. The five whitish petals surround a yellow funnel which contains the stamens and the style. Bees and other insects are attracted by the pollen and buzzing swarms can usually be seen hovering round the tree all through the flowering season.

The long, pendent leaves, crowded near the end of the branches, bear up to twenty-nine or thirty-one curiously shaped leaflets. Each about 3 inches long, they are deeply serrated, sharply pointed and curved like a scythe. Their fresh, green colour and shining surface give the tree a delicate and charming appearance and during the monsoon when the flowers have fallen and the tree is in full foliage, the curved, toothed leaves, massed round the branches, have a distinctive appearance easy to recognise. Young leaves are a pale, tender green, tinted with rust. These are eaten on the Hindu's New Year's Day to ward off sickness during the coming year. Hindus, to whom the tree is sacred, also festoon fresh leaves across their houses when there is an epidemic of small-pox. Some trees bear sweet leaves and some bitter and it is the latter which are used in curries. Dried leaves (in a bag or envelope for convenience) put in drawers and cupboards keep out moths, cockroaches, etc. Another use for these "magic" leaves is in poultice form when they are employed to heal festered wounds.

From the yellow or purple fruit, the size of a small olive, is obtained the famous *Margosa* oil which is so effective in the treatment of leprosy and skin diseases. Leaves and fruit are both vermifugal and the latter is used as a purgative. External application of oil from the seeds is believed to cure rheumatism and it also has antiseptic properties. Bark and gum yield valuable medicines, in fact practically every part of this fine tree is of value. There is a legend concerning the powerful medicinal attributes of the Nim. A woman, whose husband was about to set out on a voyage, wished to ensure his early return. She consulted a medical man who told her she must advise her husband to sleep under a Tamarind tree every night of the outward journey and under a Nim tree every night of the homeward journey. This he agreed to do. The Tamarind is reputed to exude unhealthy, acid vapours so, before many days, the

unfortunate man found himself too sick to continue his travels. He turned back and the healing power of the Nim trees under which he then slept each night, worked to such effect that by the time he reached home his sickness was cured.



Nim timber somewhat resembles mahogany. It is beautifully mottled, hard and heavy. Wood from old trees is so bitter that no insects will attack it.

Azadirachta is from the Persian name of *Melia azedarach*, to which the Nim is allied. *Indica* means Indian.

THE TEAK TREE

TECTONA GRANDIS

Saigun (Hind.) ; *Thaiku-Marun*, *Tek* (Tam.)

THERE can be few who have not heard of the Teak Tree, but there are many who have no knowledge of its appearance and are unaware of the numerous localities in which it appears.

It is a lofty tree, handsome when in flower, usually found in detached clumps and growing best by the sides of rivers. Many are as much as 150 feet high, but they take sixty to eighty years to reach maturity. The bark is ash coloured and scaly. For the greater part of the year the Teak is ugly as the huge leaves are nearly all eaten by a certain type of insect which leaves only the skeletons and, during the dry season, every leaf falls, forming a crisp carpet on the ground beneath. But from June until September, when every tree in a clump is in fresh, new leaf and crowned with a haze of blossom, they are a really splendid sight.

Large and strong, the leaves grow in pairs, each pair being crosswise to the next. Underneath, they are like soft felt, banded by hard brown cords, above they have the texture of fine sandpaper and, when reduced by insects to skeletons, the beautiful net-work of veins can be studied. In young trees the leaves are even larger—sometimes as much as 2 feet long.

Overtopping the foliage, the huge pyramids of flowers are many times sub-divided and, like the leaves, the branchlets are in pairs and alternate in direction ; they bear innumerable, minute, round buds and tiny, white flowers. Each white, scented flower is five or six-petalled and sits in a wee, round calyx, but out of the millions which appear only a few are fertile. Those few, about September, turn into small, green Chinese lanterns which eventually increase in size until they are about 1 inch across. They are papery and crumpled and much too large a covering for the small, furry nut inside. Except for the fact that many of the leaves are getting eaten and torn, the Teak now looks very handsome. The lacy pattern of the numerous flower stalks dotted with bright green balls is extremely decorative. So large are the flower spikes and leaves and so tiny the flowers that no small illustration could be of any help in identifying this tree.

The Teak is a native of India and Burma and is extensively cultivated in the North because of its great value as timber. The wood is very heavy, strong and durable, resists white-ants and contains an oil which preserves nails. It is expensive except where plentiful but is widely used for furniture, houses and ships. It is a tree which needs plenty of space ; crowded, it strives upwards towards the light, achieving only height, but, given plenty of space and good drainage, it attains great girth and strength.

Tectona and Teak are both derived from the Portuguese name *teca*. *Grandis*, in Latin, means "large".



YOUNG TEAK IN
FLOWER

THE TEMPLE TREE, PAGODA TREE or FRANGIPANNI

PLUMERIA ACUTIFOLIA

Champa (Vern.) ; *Gula-Chin* (Hind.) ; *Khairchampa* (Bom.) ; *Perungalli* (Tam.)

PERHAPS the most familiar and extensively grown of all our trees, the exotic-flowered, many-named Temple tree is in itself no thing of abundant beauty. It claims affection however for its sweet-scented flowers, which, day after day throughout the whole year, open, bloom and fall to lie immaculate on the earth beneath. To both Buddhists and Mohammedans the tree is an emblem of immortality because of its extraordinary power of producing leaves and flowers after it has been lifted from the soil. For this reason it is frequently planted near temples and in graveyards, where daily the fresh creamy blooms fall upon the tombs. The flowers are used, too, as temple offerings.

The 17th Century French botanist Charles Plumier gave the tree its name. *Acutifolia* means with tapering leaves. In Ceylon it is known as the Life Tree. Some call it Dead Man's Flower, others Jasmine Tree or *Kishira Champa* which means Milky Champa—a reference to the sticky white sap which exudes from any cut in the tree. The Hindustani name *Gula-chin* means Flower of China because the plant was wrongly believed to have come originally from China. Actually it is a native of Mexico and Guatemala.

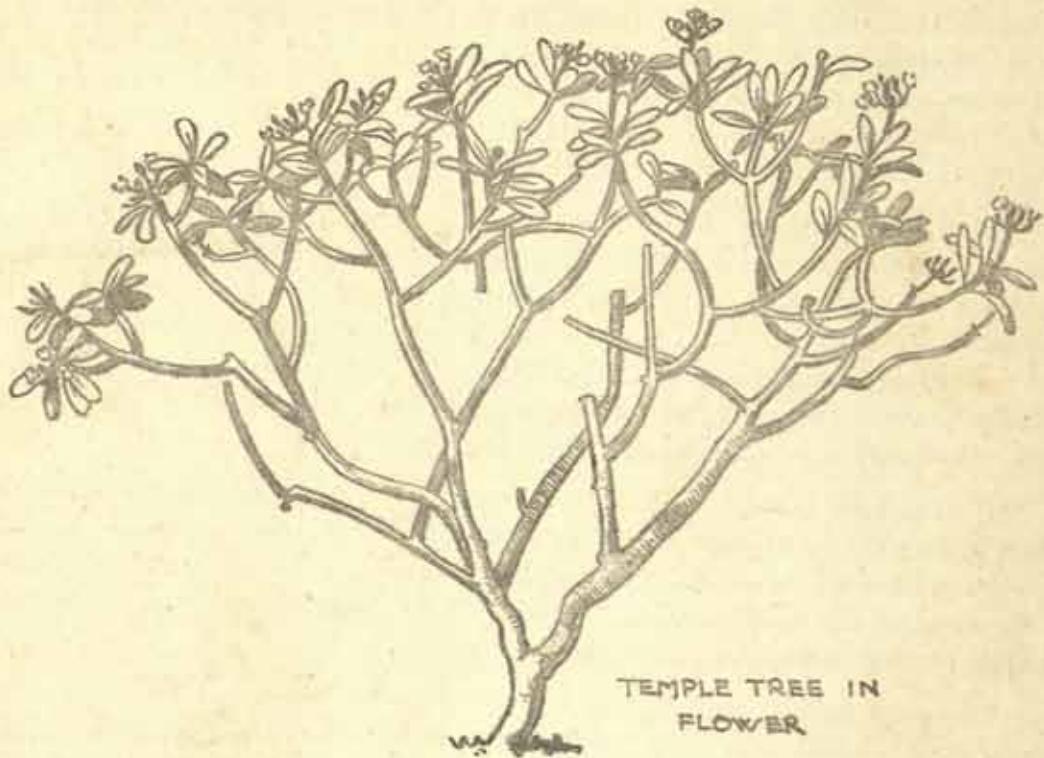
It is a low, spreading tree, or large bush, seldom attaining more than 20 feet in height. Although rarely without flowers, it is leafless from December until the rains and, beautiful though the flowers may be, they cannot conceal the ugliness of the pale, swollen limbs. Young trees do not lose their leaves and thus remain attractive throughout the year.

The grey bark is smooth but scaly and the branches hardly taper at all; flower bearing branchlets even thicken towards their extremity. The upright clusters of flowers grow on thick stalks, fleshy but brittle. From a wheel of stems rise the polished, twisted buds and waxy, white flowers. These have a bright yellow centre and the five spreading petals are sometimes tinged with pink below. The petals are overlapping and tend to curl on one side. The stamens are not visible. A cultivated tree may bear a crown of flower clusters with a couple of dozen blooms in each cluster. The fruit is a 6-inch pod which rarely seeds in India, the explanation being, according to *malis*, that as the seeds are considered to be an antidote for cobra bites, the cobras cleverly destroy them !

The distinctive leaves, up to 1 foot in length, grow stiffly in crowded spirals at the end of the branches. They are smooth and narrow, tapering more at the stem end than at the apex. Identification is made easy by the parallel, horizontal veins which run from the mid-rib to a scalloped border vein.

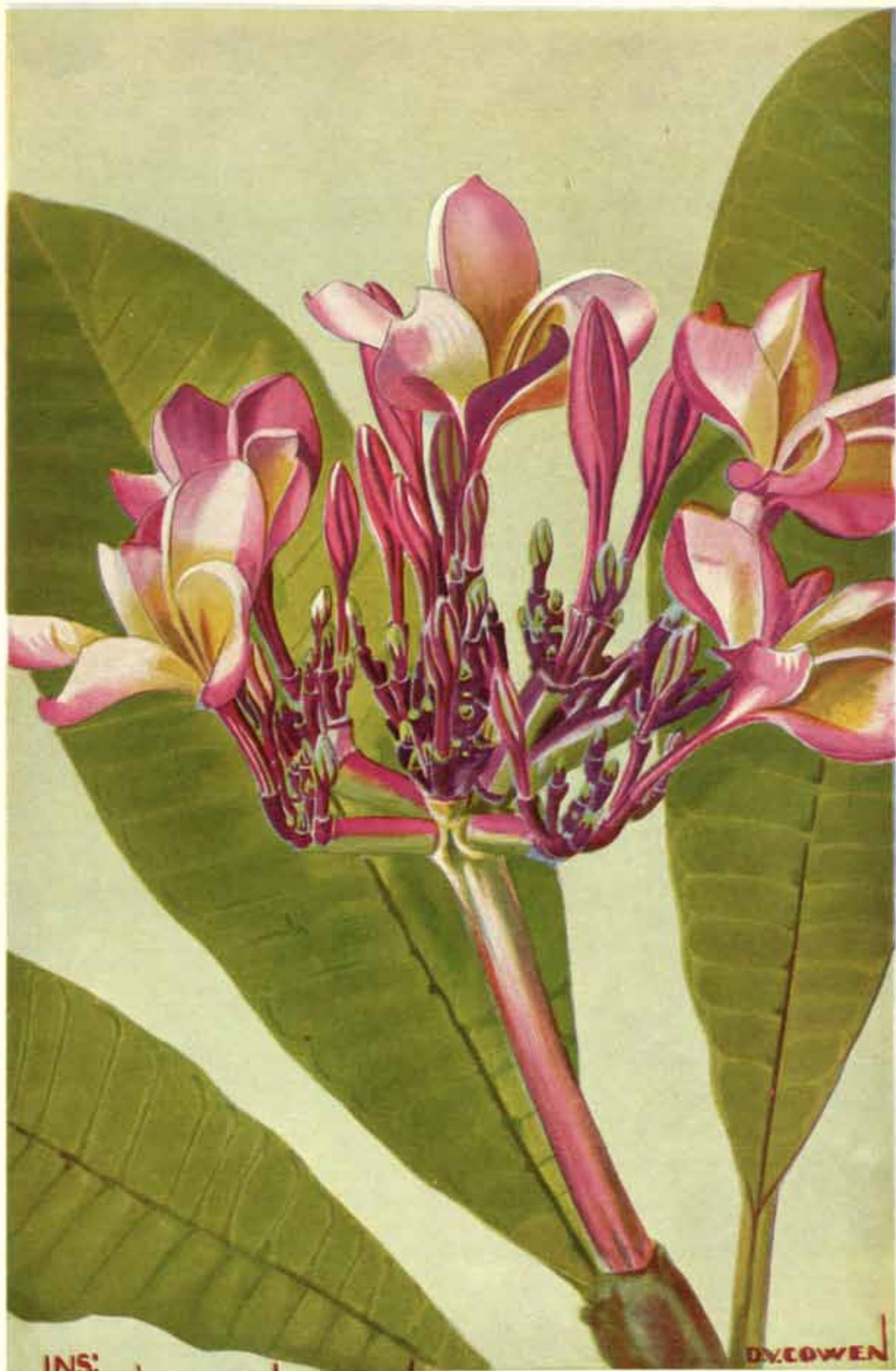
There are many uses to which this tree is put. The milky sap which flows from any wound or broken stem is used as a counter irritant for rheumatism and, in conjunction with sandalwood oil and camphor, is a cure for itch. In different parts of the world the bark has different medicinal uses ; it relieves fever, heals sores, in plaster form reduces tumours and is a powerful purgative—dangerous if given in over large doses. The heated leaves relieve swellings and the flower buds, together with betel leaves, make a good febrifuge.

A fairly common variety, which is illustrated here, has dark crimson buds and petals, which underneath, are half crimson and half white. Above, they are pink when newly opened but rapidly fade to white. The throat is a very brilliant yellow.



The true Frangipanni (*P. rubra*) is of the same genus and is named from the French word *frangipanier* meaning "coagulated milk" in reference to the white sap, a feature which this tree has in common with the Pagoda tree. It is rather smaller than that tree however and bears, amongst the handsome foliage, numerous red flowers on downy dark red stalks. The flowers are not so powerfully scented as those of the Pagoda Tree but they are used just as extensively for garlands and hair ornament.

Another species, the white Frangipanni (*P. alba*) is also a smaller tree. The leaves are similar, except that the under sides are hairy and the flowers are white with no yellow centre.



INS:

DR. COWEN

PAGODA TREE

BAOBAB or MONKEY-BREAD TREE

ADANSONIA DIGITATA

Gorak Chinch (Guj.) ; *Paparapulia*, *Purimaram* (Tam.) ; *Gorak Amlî* (Hind.)



THIS is indeed a most remarkably shaped tree. It is not common in India but the sight of even one cannot fail to arouse interest and curiosity. It is only of medium height but the girth at the base, which is buttressed, is enormous —112 feet having been recorded. This huge, swollen trunk tapers suddenly and sends out several thick, horizontal branches. In summer, when in full foliage, it has the appearance of a giant mushroom. It came to us originally from Central Africa and is now naturalised and thrives well in dry, desert areas. Not only is it one of the most fantastic looking trees but it is also one of the longest lived—in spite of the fact that it grows quickly. Adanson, the French botanist after whom it was named, claims 5,000 years for some he knew in Africa. The name *Gorakh Chinch* is in memory of the monk Gorakh who is said to have taught his disciples under the shade of one of these trees.

The leaves are large and smooth and described as digitate—five leaflets radiating from a central point. At the beginning of the year they fall, leaving a gaunt, grey skeleton ; new leaves sprout in spring just before the buds start making an appearance. These are very large and hang like balls of pale-green suede before the creamy white petals burst open. It is a massive flower ; from the back curving petals emerges a white staminal column which opens out into a purple-tipped puff. These handsome blooms appear at midnight during June and July.

The white, gourd-like fruit has a spongy, acid pulp, containing many blackish, kidney-shaped seeds, surrounded by tough fibres. This pulp is mealy and edible and from it is made a cooling drink which promotes perspiration and alleviates fevers. Adanson found the fruit a great preservative against epidemic fevers, as it tempers the heat of the blood. From it also are made preparations for soothing irritation, curing scurvy and relieving stomach complaints. Gujerat fishermen use the gourds as floats for their nets and monks dry the shells to serve as water pots. The leaves are eaten and from the bark an extremely strong rope is made. Negroes have many uses for the Baobab, including the rather gruesome one of burying their dead in the hollow trunks of old trees and the remarkable fact is that the bodies become dry without the process of embalming.

The timber is useless except for raft making as the wood is spongy. Poor people sometimes excavate the trunks of living trees to form homes for themselves.

Its rapid growth, valuable fruit and fibres, should make its extensive cultivation profitable, but so far this has not been done successfully.





DR. COWEN

1155

BAUHINIA

THE MOUNTAIN EBONY or VARIEGATED BAUHINIA

BAUHINIA VARIEGATA

Kachnar (Hindi).

PART of this book was written while returning to England by plane and I took the opportunity of the break in the journey at Cairo to visit the well-known Gazirah Club. Edging the golf course of the club was a glorious sweep of glowing purple. Even before I was near enough to identify the trees, the rich, heady perfume which filled the air told me they were Bauhinias. The sight left me breathless and it was then I realised how difficult was the attempt I was making to describe in mere words the trees I know better how to paint.

There are many species of Bauhinia, all indigenous to India, but the commonest are *B. variegata*, *B. purpura*, *B. acuminata* and *B. tomentosa*. They all have two points in common. One is the splash of colour on one or more of the petals and the other is the united, twin-kidney formation of the leaves. The name Bauhinia was given as this formation suggested the 16th century herbalists Jan and Caspar Bauhin. The Mountain Ebony in my opinion is one of the loveliest of Indian trees. It is a medium-sized tree with a dark-brown, smoothish bark. The leaves fall during the cold season and at the same time the large, sweetly-scented flowers appear. Some trees have been noted which retain their leaves on a few of the branches but on such trees the flower sprays are borne only on the leafless branches.

The large flowers grow in short sprays bearing two or three blooms, either from the ends of the branches or from the axils of the leaves. Their curved petals emerge from brown, ribbed calices which split and bend as the pointed bud protrudes. These, as also the buds and stems, are covered with a fine, silver down. Five, long, arched stamens, terminating in large anthers, are surrounded by long, pointed petals, narrowing at the base. Each petal is delicately veined and one or two are smudged at the base with a deeper colour. The flowers may be magenta, mauve, pink or white, the former three having crimson markings, the latter a striking yellow splash on one or more of the petals. The long, narrow pods are often as much as 1 foot in length and contain ten to fifteen seeds. These ripen in May and June after the flowering season is over. Young pods, also leaves and buds, are utilised as vegetables.

The leaves are from 3 to 6 inches long and as broad, are cleft at the apex, forming two rounded lobes and grow alternately along the twigs on 1 inch stalks. From the base, the veins spread out fan-wise and the leaf is more or less folded along the centre rib.

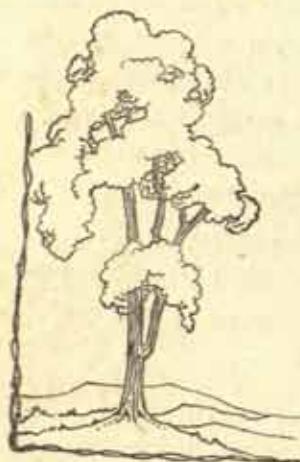
The tree yields a useful gum and from the seeds an oil is obtained. The wrappings of biddies are made from the leaves and the bark is used for tanning

and dyeing, also as fibres. The timber is good and as many parts of the tree have medicinal uses, it is planted for its value as well as for its extreme beauty.

The Purple Bauhinia or Geranium Tree (*B. purpura*) is similar in appearance to the Mountain Ebony but the flowers are mauve, lilac and deep rose or whitish in appearance. The leaves of this tree also fall during the cold season but the flowers do not appear until September and by December the long, greenish-purple pods can be seen, like french beans among the foliage. Later, when the leaves are either withered or fallen, the hanging pods give the tree a drooping, dejected appearance. The flowers are five petalled, clawed or pointed, smaller and narrower than those of the Mountain Ebony and streaked with a brighter colour. Sometimes the base of one petal is white. The buds are more winged than ribbed, dark green or brown and downy and, when the flower opens, the calyx splits into two sections, one having two wings and the other three. The underground roots of the Purple Bauhinia have been found to be extremely poisonous.

B. tomentosa from Ceylon, called *Sona* in Marathi, bears showy, yellow flowers speckled with red. On Dasara Day this tree is worshipped, the leaves are stripped and, after incantations have been repeated over them, they are distributed as tokens for gold.

Other varieties are but small shrubs, still others extensive climbers; some have tiny, cup-shaped flowers; some bear long, narrow, leaves, some broad, some short but the flowers are always perfumed and the leaves always cleft in the characteristic Bauhinia manner.



THE CORAL TREE

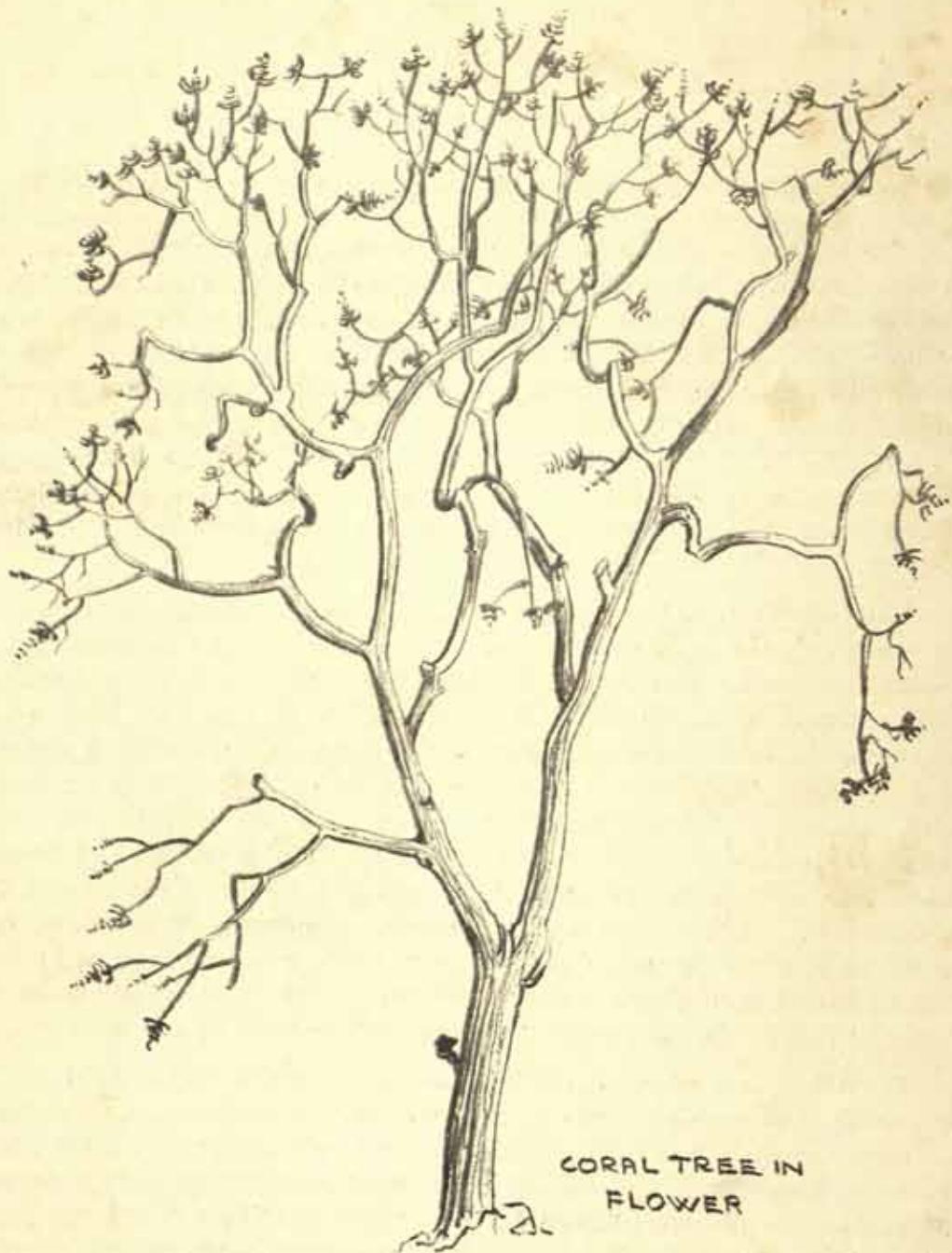
ERYTHRINA INDICA

Maruka (Tam.) ; *Pangri* (Hind.) ; *Palita Mundar* (Beng.) ; *Pangara* (Mar.)

THE Coral Tree shown here is one of several varieties of *Erythrina*, more than one of which are referred to as the Coral Tree ; but this is the tree so familiar to us from January to March when the thick, angular spikes of rich, red blooms make their striking appearance amongst the naked branches. It is one of India's own trees, growing wild along the coasts and in some inland districts of deciduous forests, but elsewhere it has escaped from widespread cultivation and grows self-sown. It is a large tree, elegant in form and handsome throughout the year, even during its leafless period. Sixty feet is easily attained and because it flowers when only 10 or 12 feet high it is deservedly popular as a garden or park plant.

The Silk Cotton Tree (*Bombay malabaricum*) blooms at the same time as the Coral Tree and usually in the same localities and the two are often confused by casual observers. However, a few points of difference serve to distinguish the two without much difficulty. Both bear red flowers on bare branches but those of the Coral are a deeper colour and in stemmed, diminishing spikes, as against the large bright red or pinkish blooms of the Silk Cotton which grow solitary, directly from the branchlets. Both trees are armed with conical prickles on trunk and branches but the bark of the Coral is smooth and curiously streaked with vertical lines of green, buff, grey and white. The last and most important point of distinction is in the branch formation ; the branches of the Coral rise obliquely from the trunk while those of the Silk Cotton grow in whorls and are almost at right angles to the main stem. With these few points in mind it should be possible to differentiate between the two trees at any distance.

The branchlets of the Coral Tree are grey, gnarled and rugged, but the flower stems which radiate from their ends are, in contrast, glossily smooth and a deep red in colour. The numerous whorls of flowers and buds encircle a good 9 or 10 inches of the stem, and are of an unusual formation. A brownish sheath enfolds the unopened flower allowing the points of two of its five segments to extend like comical "ears" ; the sheath then splits down the back and the five red petals emerge. One is an erect "standard," oblong and pointed and narrowing at the base ; two are small "wings" and the remaining two are similar in size but a deep crimson in colour and known as "keel" petals. These four small petals are partially enfolded by the base of the "standard." A long bunch of red stamens protrudes from between the "keels." The flowers have no scent, but that makes them no less popular among birds. A Coral Tree in full bloom is always like an aviary. Crows, mynahs, rosy-pastors, babbler and parakeets, as well as numerous bees and wasps swarm round the tree in noisy eagerness. By their love of the nectar the flowers become fertilised.



Very soon after flowering the big pods begin to form. They are green at first, later turning black; their 6 to 12 inches of length may contain up to a dozen smooth red or purple egg-shaped seeds. Between each seed the pod is constricted and the whole is curved and pointed.

Some Coral Trees, particularly young ones, do not lose all their leaves before flowering; others attain a new leaf growth whilst the tree is still in flower. The leaves are large and composed of three broad leaflets, each on a short stem, the end one being the largest.



D. EDWARDS

INS:

CORAL TREE



The country people of India have turned to their own account Natures forethought in arming this tree against the depredations of cattle and other animals and plant it as a hedge around cultivated gardens. It is also widely used as a support of peppers and grape vines, its qualifications for this position being in its quick growth and suitable bark. More important is the fact that, during the hottest months, the crowded foliage gives deep shade to the vines and keeps them moist: when the days become cool all the leaves fall and the vines receive the sun they need.

New leaves are eaten in curries and the wood is much used for small, carved articles, as it neither splits nor warps.

The Coral Tree comes into Indian legends and it is supposed to have been grown in Indra's garden, from where Krishna stole the flowers. Then Rukhmini and Satyabhama quarrelled for the possession of the precious blooms.

There are a large number of species of *Erythrina*, most of them remarkable for their brilliant red flowers, borne during the leafless period of the tree. The name refers to the colour of these blooms, *Erythros* meaning "red". Of *Erythrina indica* there are also several varieties including a white one—actually the flowers are a dirty, translucent white and not at all attractive—but the "standard, wing and keel" formation of the flowers of all the species makes identification reasonably easy.



THE QUEEN'S FLOWER or CREPE FLOWER

LAGERSTRÆMIA FLOS-REGINA or *L. SPECIOSA*

Arjuna, Jarul (Hind.) ; *Kadali, Pumarahu* (Tam.) ; *Taman* (Vern.) ;
Lendi (Mar.)

THE period of leaf-fall when, among the blackened nuts and ragged dusty leaves are revealed the short knotty bole and big twisted branches is worth enduring for the beautiful sight of the Queen's Flower in bloom. Flowers and new leaves appear in April, mantling the tree with a rich cloak of clean, delicate colours. Blooming right through the hot season until July, it is deservedly popular in gardens and villages. But the true home of this fine tree is in the damp jungles of Assam and Burma, of Ceylon and Travancore, in swamps and along the river banks. Here it grows tall and straight, a handsome tree, providing excellent and valuable timber. In full bloom the pale greens and variegated clusters of flowers stand out in sharp relief against the dense darkness of the jungle.

The smooth bark is grey, patched with buff and cream. The tree is deciduous but leaf-fall is gradual so that it is rarely quite bare. In the hot season the big upstanding pyramids of flowers appear ; they vary on different trees, some being mauve, some a lovely pinky-mauve, others a definite pink. There is also a white variety. New flowers are a deep tone, old ones fade almost to white and the various shades interspersed along the sprays give them a delightful appearance. The buds at the end are a soft bluey-green, often tinged with pink and the ridged sepals make them look like little velvet urns. Inside, the six or seven sepals are a very pale green and are revealed between the narrow bases of the petals. These petals are very crumpled and wrinkled, giving the tree its alternative name of Crepe Flower. There are either six or seven petals and the whole flower measures some $2\frac{1}{2}$ inches across. Yellow dotted stamens and a long style radiate from the centre. At the end of the flowering season the numerous fruits form, sitting like little green crab apples in the withered calices. Later they turn black and often remain on the tree for a long time, even through the next flowering and fruiting season.

The leaves grow alternately and in all directions along the branches. They are bright green, paler below and heavily veined on the under side. Each is a pointed oval from 5 to 8 inches long and grows from a short stalk. Before they fall in the cold season they sometimes turn an attractive coppery shade and if not already disfigured by the ravages of insects, lend the tree a temporary charm.

As well as being an important timber tree, next in value to Teak, the Queen's Flower has many medicinal uses among the country people. The roots are astringent, the seeds narcotic, the bark and leaves a purgative. But it is chiefly for decoration that this handsome tree is planted so widely.

Lagerstroemia Indica (Indian Lilac or Crepe Myrtle) is a beautiful shrub with white, rose or mauve flowers which appear from May to August.



JAVA CASSIA



QUEEN'S FLOWER

PINK CASSIAS

*CASSIA GRANDIS, CASSIA MARGINATA, CASSIA RENIGERA,
CASSIA NODOSA and CASSIA JAVANICA*

IN delicate contrast to the vivid hues of our other spring flowering trees, the Pink Cassias, with their lovely cool shades of pinks, greens and white, are a beautiful and restful sight. No one could fail to be moved by the glory of a Cassia in full bloom when its long, sweeping branches are laden with blossom. Each of the five varieties has its own individual, almost indescribable charm. At a glance it is difficult to distinguish one from another but a little study reveals numerous characteristics. None are indigenous to India but have been introduced from various tropical countries. They quickly became popular and are now common in gardens and on roadsides. Few of them have names in any vernacular.

The first to bloom is the Horse Cassia (*C. grandis*). In the winter all the leaves fall and in March or April, from the axils of the old leaves rise fine sprays of rose-pink flowers, shading to pale peach and coral according to the amount of sunlight received. The flower branchlets spring rather stiffly from either side of the main stem giving a different appearance to the softly drooping sprays of the other Cassias. There are no bracts at the bases of the flower stalks.

The leaves are pinnate and bear from ten to twenty small, oval leaflets, rounded at the ends. When young they are soft and downy and the end leaflets have a distinctive wash of bronze. The fruit is a wrinkled 3-inch pod, smooth and cylindrical.

The Red Cassia (*C. marginata*) known as *Vakai* and *Kirudam* in Tamil and *Samarela* in Telegu, is smaller and less robust than the other varieties, but is extremely beautiful at all times of the year. The name refers to the thickened margins of the leaves. In May and June, the upper surfaces of the downward sweeping, hairy branches are laden with copious, short clusters of deep pink flowers. The tree appears almost overweighted with the profusion of blossoms. The flowers are quite small, little more than 1 inch across, with five petals, two of which are often slightly larger. The calyx is pink and the nine stamens are in three groups; three are very long and curved, the next four are less than half that length and all bear red anthers. The remaining two are very short and have yellow anthers. The flowers are more of a salmon-pink than the other Cassias and each petal is delicately veined with green, the pink becoming deeper as the flower ages. The bracts at the bases of the flower stalks are palegreen and the calices pink. Each leaf bears from five to ten pairs of small leaflets, oblong and blunt ended. The pods are slender 10-inch cylinders.

The Burmese Pink Cassia (*C. renigera*) is thus named because of the kidney-shaped appendages from which spring the leaf stalks. It is a small tree—not more than 20 feet but in May when the large, showy flowers and



tender, green leaves appear, it presents a strikingly beautiful picture, enhanced by the varied tones of pink in each dense cluster. These clusters rise on short stems from the scars of the old leaves. At the base of each flower stalk is a bract like a small leaf and these numerous bracts crowded together form a long clump from which spring the downy, red stalks. Outside, the calyx is dull red; inside, the palest green. The flowers, each about 2 inches across are a deep pink when young, but fade almost to white. The ten yellow stamens are in groups of three, four and three, crowned with delicate green anthers. The longest three are curled like the letters "S" and have a curious balloon-like swelling in the middle. The leaves, which fall in December, leaving the tree adorned only by the long blackened pods, are up to 1 foot in length. Each bears from eight to twenty pairs of downy oblong leaflets, rounded at the tips.

Cassia nodosa. The name alludes to the node, or swelling in the longest stamens, but as other species also have this characteristic the name is rather misleading. It is a larger tree with a fine, spreading crown. In May the flowers appear in groups along the downy branches, each cluster borne on a short stalk. The flower stems are red and grow in whorls. The buds and flowers are deep pink, fading to white and each petal is somewhat pointed at the tip. The calyx is green and velvety and the bracts narrow ovals. There are ten yellow stamens, the longest three having a round swelling in the middle. The pods grow as long as 18 feet and are an unattractive feature of the tree. A leaf may be from 6 to 12 inches long and comprise up to thirteen pairs of leaflets. These are pointed at the apex, leathery and slightly glossy.

The Java Cassia (*C. javanica*) is very similar to the last species, but the few distinguishing features can be observed with little trouble. It is slightly smaller, but has the same spreading crown, long drooping branches and numerous, feathery leaves, but the branches are rough. The flowers are similar but the sepals are smooth, green inside and deep-red underneath. The petals are rounded and the bracts heart-shaped and pink-tinged. Similar, too, are the ten stamens and the pods, but the latter attain a greater length. In the number of leaflets and length of leaf they are alike but these leaflets are rounded and have no gloss. They are smooth and silky to the touch.

SUMMARY OF PINK CASSIAS

Medium size—

- Leaflets, 10—20, blunt, some tinged bronze.
- Flowers pink to coral
- Stamens 8
- Bracts none
- Pods 3"—6", wrinkled.
- Blooms March.....Horse Cassia.

Small size—

- Leaflets, 10—20, blunt.
- Flowers 1", salmon-pink, brighter with age, veined green.
- Sepals pink.
- Stamens 9, with no swelling, anthers red.
- Bracts green.
- Pods 10", grooved.
- Branchlets hairy.
- Blooms May.....Red Cassia.

Small size—

- Leaflets 16—40, blunt, stipules kidney-shaped.
- Flowers 2", fading to white, petals narrow and pointed.
- Sepals red, green inside.
- Stamens 10, 3 with swelling, anthers green.
- Bracts green.
- Flowering branches leafless.
- Pods 10" smooth.
- Branchlets hairy.
- Blooms May.....Burmese Pink Cassia.

Large size—

- Leaflets 12—26, pointed, stipules crescent-shaped.
- Flowers 2½" dark pink fading to white, petals broad, blunt.
- Sepals green, downy.
- Stamens 10, 2 with swelling, anthers brown.
- Bracts green, lance-shaped.
- Flowers and leaves mixed.

Pods 18".

Branches downy.

Blooms May.....*Cassia Nodosa*.

Medium to large size—

Leaflets 12—26, blunt, stipules crescent-shaped.

Flowers $2\frac{1}{2}$ " fading to white.

Sepals red, green-lined.

Stamens 10, 3 with swelling, anthers brown.

Bracts pinkish-green, heart-shaped.

Flowers and leaves mixed.

Pods 24".

Branches rough.

Blooms May.....*Java Cassia*.



THE BELLERIC MYRABOLAN

TERMINALIA BELLERICA

Bahera (Hind.) ; *Tani* (Tam.) ; *Beheda* (Mar.)

THE Belleric Myrabolan belongs to a very large family of important forest trees and because of its handsome appearance and fine proportions it is often planted by roadsides. It is found throughout the forests of India, Burma and Ceylon, below elevations of about 3,000 feet, but not in the very arid regions. It is deciduous, losing its leaves between November and April in dry places and only during February and March in damper situations. It grows well on poor soil and in the best conditions will reach a height of 120 feet or more. In some places the timber is not popular being subject to insect attack and the tree is often left standing, tall and conspicuous amongst the new sapling growths. In others it is considered worth the cutting to make into planking, packing cases, etc., but in the South Deccan it is left untouched because of a superstition that it is inhabited by demons.

The bark is dark-grey and fissured by numerous, longitudinal cracks.

From March to June the tiny flowers appear, filling the air around with their strong honey scent. There are many who find the scent objectionable, but to me it is so exactly like honey that even at close quarters I find it delightful. Springing from amongst the leaves at the ends of the branches, like long, creamy tassels, the flower sprays bear numerous, globular buds and tiny, cup-like flowers. Each of these rests on a stout, short stem and divides into five lobes from which rise ten stamens.

The leaves, fresh and shining, which appear with the flowers, are large and closely packed round the ends of the branches. They grow on stems from 1 to 4 inches long and are wedge-shaped at the base, terminating bluntly, like a Jack-fruit leaf. They are very tough and have a strong, broad centre rib.

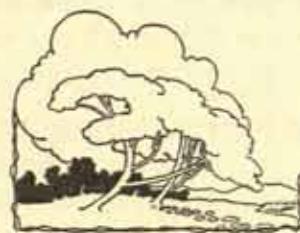
The fruit is a grey velvet ball about 1 inch across and is the most important part of the tree. It is used commercially as a medicine and as a inferior dyeing and tanning material ; also for making ink. The kernels yield an oil which is used on the hair and are also eaten, although an excess is said to produce intoxication. Monkeys, deer, squirrels, pigs, goats and other animals greatly favour this fruit and few are allowed to remain long on the ground.

The name *Terminalia* is from a Latin word meaning terminal and is given because in many of the species, including this one, the leaves cluster at the ends of the branches. *Bellerica* is a corrupted and Latinised form of the Arabic name of the fruit. The fruit is known as Myrabolan and this name is also used for the fruits of *Phyllanthus emblica* and *Terminalia chebula*, the three making the tonic known as *Trefala Churan*.

Another well-known member of the family is The Indian Almond (*T. catappa*) known in Tamil as *Nat Vadam* and often incorrectly called *Jungli Badam* in Hindi. *Jungli Badam* is the Wild Almond or Poon Tree (*Sterculia foetida*). The Indian Almond is a tall tree easily recognised at any stage of its growth by its whorled horizontal branches and dense layers of foliage. Also by its large, rough leaves, which, twice a year, in February and September, turn bright red and give the tree a handsome and striking appearance. While still red they fall and soon after, the new, brilliant green leaves appear. The tree is cultivated in most parts of India and Burma and is popular for garden and avenue planting, also for its edible nuts.

The Arjun (*T. arjuna*) is another handsome member of the family. It is tall and evergreen and may be recognised by its smooth, grey bark, often tinged with green and red; its winged fruit; oblong, opposite leaves and the fact that it is usually found on the banks of streams. The flowers are rather similar to those of the Myrobalan but the tassels are spaced further apart, springing from the axils of the leaves and the ends of the branches.

T. tomentosa, known as *Saj* and *Maddi*, is like the Arjun in many ways but can be distinguished by its very dark-grey, cracked and fissured bark and the veins on the wings of the nuts. These run at right angles to the nut. It is a common forest tree but is rarely seen outside forest areas. It yields an excellent, hard timber.







MANGO



BELLERIC MYRABOLAN

THE MANGO

MANGIFERA INDICA

Am (Hind.) ; *Amba* (Mar.) ; *Mangas* (Tam.) ; *Mamid* (Tel.)

ALTHOUGH the mango is probably the best known fruit in India there are many people who would not recognise the tree unless it was bearing large, ripe fruit. Leaves, bark and shape, however, are sufficiently distinctive to make recognition easy even if there are no flowers. Rounded banks of dark green foliage and deep shadows enfold the stout, black limbs; these and the short trunk, are clothed in thick, corky bark which cracks and comes off. Retaining its leaves all through the year, the Mango makes an excellent shade tree. The smoothness of the leaves reflects the heat, their position gives maximum shade and their strong, springy stalks are not easily broken by the wind. Thus there is rarely any glint of sunlight to be seen in the cool shadows of a Mango tree.

From January to March the long, upstanding pyramids of flowers appear beyond the leaves. Thick, green, ridged and tapering stems bear numerous, diminishing side stems. On each of these are borne a large number of tiny, stalked flowers, white and greenish-yellow in colour, four or five-petalled with each petal orange-striped. When the trees first bloom the flowers are pleasantly fragrant, but later turn quite disagreeable. Of the thousands of flowers which bloom only a few are capable of producing fruit. These are perfect ones, the rest being only one-sexed.

Two and a half to three months later the fruits ripen. These vary tremendously. The best fruits are from grafted trees, which trees are smaller and not so long-lived as those grown from seed. But they are the ones which produce the famous Alphonse variety, between which and ordinary seedling fruit there is as much difference as between the best eating apple and a crab apple. Weighing anything from 6 ozs. to 4 lbs. this fruit *par excellence* of India has a tough, thin skin, green or yellow and red in colour; pinkish, juicy, flesh and a large, oval, fibrous stone. Inferior fruit have a flavour of turpentine, but a good quality fruit should have no trace of this. Those fruits not considered good enough for eating raw are made into chutneys, pickles, and preserves.

The leaves are large and leathery, oval in shape and borne on longish stalks with a thickening at the base. They crowd round the ends of the branches in all directions. New leaves are copper-tinted and drooping—Natures way of reducing the effect of heat and light.

It is known that the Mango has been established for many, many years. Buddha was presented with a grove of Mangoes, beneath which he could find repose: So, to Buddhists, it is a sacred tree. To the Hindu religion, too, it is of great importance. To them, it is a transformation of the god Prajapati,

the lord of all creatures, and so, on holy days, the twigs must be used as tooth-brushes and the leaves as spoons for the pouring of libations. Rooms in which marriage ceremonies are held are festooned with Mango leaves and the wood is sacred because it is included in funeral pyres. The flowers are dedicated to the moon, to whom they are offered on the second day of *Māgh*, and to *Madan*, the Indian equivalent of Cupid.



The Mango, being so valued for its fruit, is rarely used for other purposes. The timber is soft and not durable but admirable for planking, packing-cases and tea-boxes. The bark gives a gum used in medicine.

THE RAIN TREE

PITHECOLOBIUM SAMAN or *SAMANEA SAMAN*



RAIN TREE.

LARGE, handsome and spreading, the Rain Tree is easily recognised by its canopy of evergreen, feathery foliage and puffs of pink flowers. It is frequently planted in groups or as an avenue because of its ability to keep its symmetrical conformation in spite of prevailing winds. It is a tree of rapid growth, brought originally from Central America to Ceylon and forwarded from there because it was considered to be a tree of great value for railway fuel. It often reaches a height of 90 feet and the strong, spreading branches may be nearly as long.

From March to May and again towards the end of the year the green canopy is dotted all over with pink and white. During the rest of the year, too, there are usually quite a few flowers to be seen. The flowers each appear like round, silken tufts, but actually each flower stalk bears one central and a surrounding circlet of flowerlets, up to twenty in number. Each has a tube-shaped calyx and a tiny, yellow-lobed, crimson trumpet; bunches of long stamens, half pink and half white, protrude from each.

The long, heavy leaves are twice pinnate and each pinnæ, of which there are four to eight pairs, bears from three to seven pairs of leaflets. These are oval and have no stalks, becoming larger and more curved towards the end. They have the remarkable power of changing their position in accordance with atmospheric conditions. In full sunshine they are horizontally spread, allowing no single beam of light to penetrate the dense crown ; but at night, in dull weather, or during rain, the pairs of leaflets fold together, the leaf stalks droop and each pinnæ swivels on its thickened base so that the leaves all lie sideways. In Malaya this drooping of the leaves is considered to portend rain and is the explanation of the name Rain Tree, but in India it is believed that the name was given because of a curious habit possessed by the tree of intermittently spraying the ground beneath with moisture. Later it was discovered that this was caused by multitudinous minute insects.

A close relation of the Rain Tree and also of the Babul and somewhat alike the former in its general appearance is the Frywood Tree. *Albizzia lebbek* (or *Acacia lebbek*), known locally as the *Siris* or *Sirissa*. This bears, in April, innumerable heads of fuzzy, green and white scented flowers. The leaves, pinnate and bearing small, long and oblique leaflets, fall during the hot season and the tree is naked except for the large, yellow pods. Shallow rooted, it is easily blown down by gales and is also susceptible to a form of rot which affects the roots and base and causes the tree to crash down without warning.





DYCOwen

INS:

FLOWER OF THE RAIN TREE

THE JACK FRUIT TREE

ARTOCARPUS INTEGRIFOLIA or *A. HETEROPHYLLUS*

Kanthal (Hind.) ; *Pila* (Tam.) ; *Phanas* (Mar.)

THIS large, evergreen tree, with its dense crown of dark-green leaves bears the largest edible fruit in the world. Hanging from branches, trunk and even from the roots of older trees they look like huge, ugly parasites. But it is one of the most important fruit-trees of India, only slightly less valued than the mango and plantain.

The Jack-fruit is native to the forests of the Western Ghats ; elsewhere, throughout the warmer regions of India, Burma and Ceylon, it is cultivated or has run wild. Fast-growing, it varies in size and conformation according to the type of soil ; in sandy soil it becomes tall and spreading ; in stony soil short and thick and if the roots remain in contact with water the tree will not bear fruit. The bark is dark-grey-brown, rough and warty.

The leaves grow alternately in close bunches at the ends of the branchlets. They are large, thick and leathery, oblong in shape with a blunt end and tapered towards the short stalk. They are usually entire but sometimes slightly lobed in young trees. Above, they are deep green and glossy ; below, paler and stiffly hirsute.

The flowers are unusual. Male and female flowers are separated but grow on the same tree. Innumerable flowers, all of one sex and each minute in size, cover a small cylindrical appendage and the whole is enclosed in two green sheaths. The Male appendages grow at the end of short leaf-bearing twigs and are inconspicuous amongst the leaves when in bud. The falling sheaths reveal them as dense, yellow catkins. Female flowers are grouped together in large prickly heads directly on the trunk or limbs. February and March is the usual time for flowers to appear.

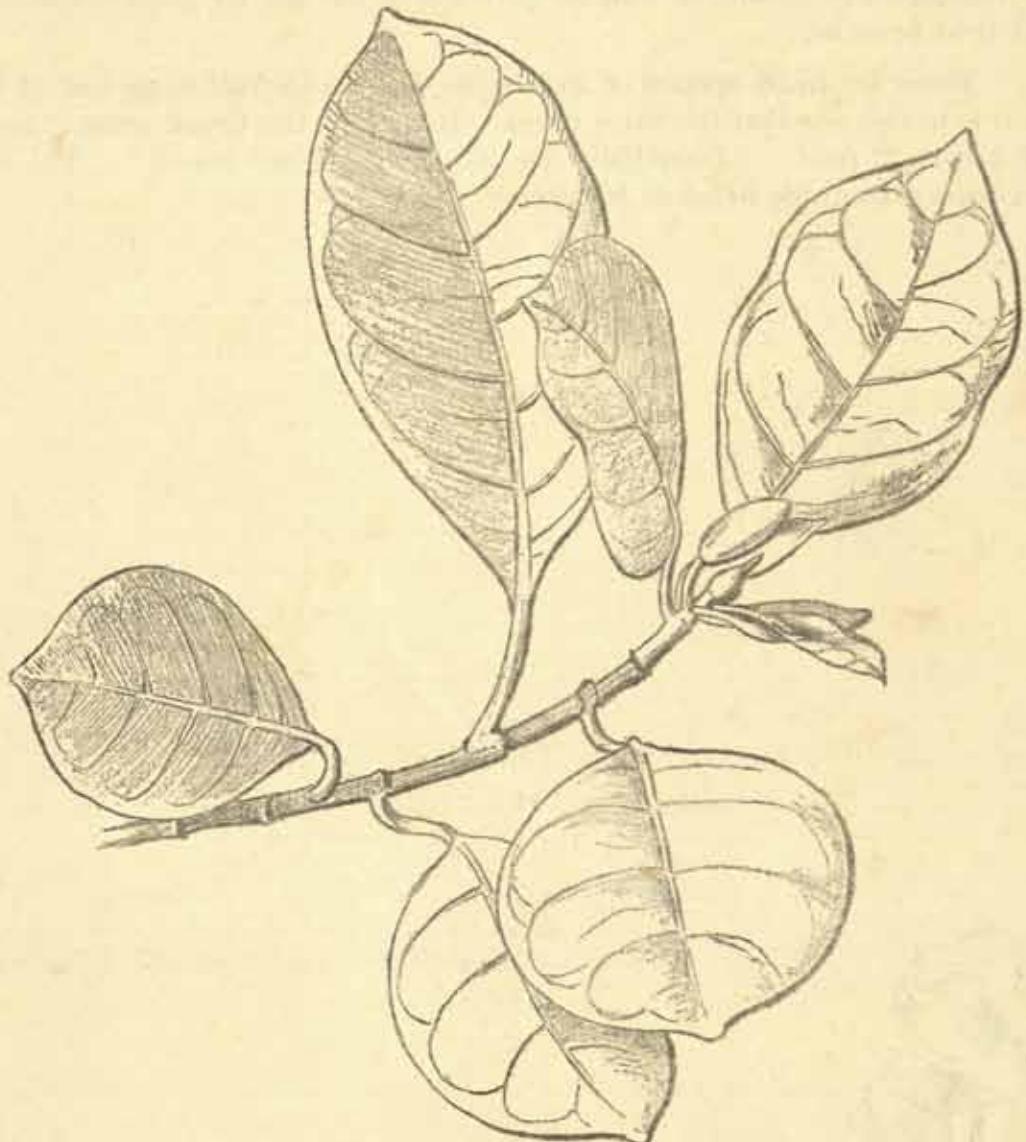
The enormous fruits, sometimes as much as 100 lbs. in weight, are irregularly oblong or round. Their rough skin is covered with numberless, conical studs. When immature they are green, later becoming more yellowish and eventually brown. Inside, many small cavities, each containing one seed, are surrounded by a soft, brownish pulp.

On young trees, fruits are found only on the branches, but on older trees they grow in great clusters down the trunk. Very old trees even bear fruit on the exposed roots. They are eaten in tremendous quantities by the peoples of the East but Europeans usually find their odour sufficiently unpleasant to discourage further acquaintance. Ripe fruits are nutritive but laxative ; large quantities can be indigestible and apt to produce diarrhoea. Unripe fruits are very astringent. There are several varieties of Jack-fruit of which



JACK FRUIT TREE
WITH FRUIT

the honey-jack is considered the sweetest and best. Fruit is eaten raw, boiled or fried, in curries and in pickles, also dried like figs; the seeds are roasted if not discarded. If the pulp is boiled in milk, strained and iced, it forms a palatable dessert like blanc-mange. To the unwary, Father Tavares gives this warning about the eating of Jack-fruit, "It must be eaten when full ripe and not at meal times. A cup of cool water should be taken immediately afterwards, never wine or other fermented drink, since these, when combined with the *jaca* are poisonous."



JACK FRUIT TWIG WITH MALE RECEPTACLE

The numerous economic uses to which this tree is put, make it of considerable value. A sticky, white latex is obtained from young shoots which makes a good bird-lime, and the fruit juice gives a kind of caoutchouc or rubber. A diet of Jack-fruit leaves is said to be fattening to cattle and goats. The timber, known as Jackwood is used for furniture ; at first it is pale, but later turns almost as dark as mahogany and takes a fine polish. From the heart wood, usually by the process of boiling sawdust, is obtained a strong, yellow dye which is used in Burma to dye the robes of *phoongies* or Buddhist priests. The Nambudri Brahmins of Malabar produce sacred fire by the friction of dry Jack-fruit branches.

There are many species of *Artocarpus*, the Bread-fruit being one of them and it is to this one that the name refers. It is from the Greek *artos*, "bread" and *karpos*, "fruit". *Integifolia* means "with entire leaves". The name Jack-fruit is from the Sanskrit *tchackka*.





INS: 1

BUCKWEN

FLOWER OF THE TULIP TREE

TULIP TREE, SCARLET BELL TREE or FOUNTAIN TREE

SPATHODEA CAMPANULATA

Patadi (Tam.)

THERE are several species of *Spathodea* but the Tulip Tree is quite the most striking and also the most common. Originally from tropical Africa, it is now planted in many parts of India, both as decoration and for shade: But in those places where it has to stand up to the buffeting of monsoon winds it does not attain the fine proportions and erect dignity of those trees, more happily placed.

It is a large tree, deciduous in drier places during the hot weather, but never quite bare in other places. The leaves fall during February, then in March and April new ones appear in profusion, together with magnificent clusters of orange and crimson flowers. These are borne on the ends of the branchlets and are first heavy compact masses of dark olive-green, velvety buds, in up-turning whorls. The buds in the lower circle then bend out and burst into fiery bloom—large crumpled bells, crimson and orange in colour. Four brown anthered stamens rise from the centre. The tree is now aglow, dozens of scarlet torches stand out in brilliant contrast to the deep-green of the foliage. By the end of April all the flowers have fallen but at several times during the rest of the year odd clusters will appear and there is quite a definite flowering period between October and December.

The leaves, which mass towards the ends of the branches, are large and smooth. They consist of from four to nine pairs of 2-inch leaflets and a terminal one. These are oval in shape and fairly deeply veined. Very young leaves are downy underneath.

The fruits appear like the fingers of a hand, pointing upwards and outwards above the foliage. Each one is some 6 or 8 inches long, green and brown in colour and smooth. Trees in Bombay rarely bear fruit.

The name Fountain Tree and many of the African vernacular names originated because the soft buds often contain a quantity of liquid and small boys discovered that by squeezing them they could be made to emit a jet like a water squirt.

African hunters make use of the hard nuts by boiling the centres and thus obtaining a poisonous liquid.

Tulip Tree wood is difficult to burn and makes poor firewood but because of this property it is ideal for constructing the sides of blacksmiths bellows.

Spathodea is a Greek word meaning "spathe"—referring to the ladle-like shape of the calices and *campanulata* describes the bell-shape of the flowers.



TULIP TREE IN
FLOWER

RIO GRANDE TRUMPET FLOWER

BIGONIA MEGAPOTAMICA

OUR attention is first drawn to this charming little tree by the scattering of delicate, pinkish flowers around its base. In fact there always appear to be more flowers on the ground than on the tree. Among the foliage, in small clusters of three blooms at the most, their pastel tints get lost against the patches of sky ; but carpeting the grass below, their frail, fresh charm demands a closer inspection.

The tree is a native of Brazil, rising to 25 or 35 feet, with ash-grey furrowed bark. It is deciduous with graceful sweeping branches and numerous small branchlets. The leaves, which never form a very compact crown, are compound, consisting of one or two pairs and one terminal leaflet. These are a bright olive-green, smooth, inconspicuously veined and oblong, with blunt tips. They are about 4 inches long.

The scentless flowers appear throughout the year but never in great profusion. In small groups at the end of the branchlets, they spend their short lives hidden among the foliage and fall while still fresh. They are trumpet-shaped and of the palest lilac pink with five frilled and crinkled lobes. The bright yellow tube is painted inside with orange or purple streaks and the whole flower has an appearance of ephemeral fragility, in great contrast to many of the bold blooms of the East. As a rule the tree does not fruit in profusion, but some years show quite a considerable sprinkling of pendent green pods. They are cylindrical and about 6 inches long.

The tree is fairly common in India and the flowers being easily acquired, are often used by women to decorate their hair.

In the South of India a white flowered variety, *B. crispa*, known as *padiri* is very common. The flowers are similar in formation but the leaves are brighter and distinctly veined. Hindus use the fragrant flowers in their temples as an offering to the Gods.



RIO GRANDE
TRUMPET FLOWER



TAMARIND or INDIAN DATE

TAMARINDUS INDICA

Ambli, Imli (Hind.) ; *Puli* (Tam.) ; *Tintil* (Beng.) ; *Chinta* (Tel.) ; *Amlí* (Mar.)

IN spite of the fact that the flowers of the Tamarind are inconspicuous, it is quite one of our most handsome trees. It grows to a large size and great age and at all times of the year is a beautiful sight with its fine, spreading limbs and canopy of billowing foliage. Native to tropical Africa, it is now cultivated all over India, Burma and Ceylon, where it is much esteemed as an avenue, park or garden tree, for its useful fruit and for its highly prized timber.

The Tamarind has a short, strong trunk, sometimes slightly buttressed to bear the weight of the wide, spreading crown. The thick bark is almost black and covered with longitudinal fissures and horizontal cracks.

In May and June the small, scented flowers appear in loose, terminal and lateral sprays. Inconspicuous amongst the mass of foliage, they are found, on close examination to have an unexpected beauty. Each flower is rather more than one inch across and the four creamy or yellow sepals spread to the full width, appearing more like petals. The actual petals are three in number, one being smaller. They, also, are creamy or yellow but are covered with a fine net-work of deep red veining; the edges are closely pleated. Three green stamens and one long pistil curve from the centre. Before starting to open the buds are enclosed in two sheaths, often crimson in colour and these make a pretty variation on the flower sprays. The pods, which are usually fairly numerous, vary considerably in size and shape. Many are sickle-shaped, some like long, thick beans and others nearly as short as their breadth. They are at first green, but a dun, felt-like film over the green makes them appear brownish. When ripe they are buff and brittle. The seeds, from one to ten, are contained in a fibrous pulp and the pod is more or less constricted between these seeds. In some varieties of Tamarind the pulp is brown and acid, in others it is sweet but the best is considered to be the one with reddish pulp.

The tree is never quite leafless but at times it is bare enough for many of the branches and twigs to be seen. Then the leaves are dark green and dull: But at the beginning of the year and sometimes in September, too, new, fresh leaves appear. The transformation is striking. One week there is a tired, dusty tree; the next, a billowing cloak of brilliant green covers it from top to bottom and there is barely a glimpse of branch or twig.

The leaves are compound, dividing into ten to twelve pairs of leaflets. These are quite small, becoming even smaller at the end; they are oblong, smooth and grow obliquely.

There are many uses to which the fruit is put. The pulp is a popular ingredient for curries and preserves. Sometimes it is pressed, preserved and sold by weight in the bazaars. It also makes a good sherbert. Medicinally it is used as a laxative. The seeds, ground to powder and boiled to a paste with gum, make a strong cement ; from them, too, is obtained a substitute for wheat or other flour, used by jungle people to make *chapattis*. The husks of the seeds have even been employed for road surfacing. It was also discovered that from the seeds could be made a cheap, efficient substitute for cereal starch which is used for sizing cotton yarn, jute fabrics and woollens.

Leaves and flowers, too, are useful as they are both edible and the leaves make a good poultice for boils ; also an infusion from them makes a fine yellow dye which is used to give a green colour to silks previously dyed with indigo.



TAMARIND

The wood is highly prized, though hard and difficult to work and it is unfortunate that the heart wood is so small. However it is widely used for making wheels, mallets, furniture, oil and sugar mills, etc.

Country people have a prejudice against sleeping under Tamarinds because they say the trees exude unhealthy vapours. This is no doubt correct to a degree as the cloth of tents pitched under Tamarinds in wet weather become discoloured and rotten after a time ; many plants will not grow beneath them but it is a mistake to suppose that this applies to all herbs and shrubs. In the description of the Nim Tree is a legend concerning these acid exhalations.

The name Tamarind is from the Persian *tama-i-Hindi* which means Indian date.

THE CORK TREE or TREE JASMINE

MILLINGTONIA HORTENSIS

Akas Nim (Hind.) ; *Karkku* (Tam.) ; *Kavuki* (Tel.)

THE Cork tree is cultivated in most parts of India both in gardens and avenues. Tall and straight, with comparatively few branches its claim to popularity lies in its ornamental value rather than any shade-giving properties. It is a fine tree, fast growing, but with brittle wood, liable to be damaged by storms. In favourable positions it can reach 80 feet in height.

The ashy bark is cracked and furrowed and the numerous fissures make removal of the cork an easy matter. It is used as an inferior substitute for true cork.

From April until the rains and again in November and December, a profusion of silvery-white, delightfully fragrant flowers crown the foliage. Upright open clusters with drooping blooms terminate every branchlet. Each flower is a tiny bell-shaped calyx, a long slender tube of palest green dividing into four waxy, white petals and several conspicuous yellow anthered stamens. One petal is longer and cleft. Many flowers are delicately tinted with rose. As they fall very soon after opening, the flower sprays consist largely of long whitish buds, while the ground below is spangled with innumerable little stars.

Between January and March the leaves are shed and renewed during April and May, although the tree is never quite naked. The long leaves bear two or three widely spaced pinnæ, each with five or seven smooth leaflets, oval, pointed and slightly round-toothed. Each is from 1 to 3 inches long. Sometimes the lower pinnæ are again divided and bear one pair of three leaved pinnæ, one or two pairs of leaflets and one leaflet at the end.

The fruit is very long and narrow, pointed at both ends and contains thin, flat seeds. Trees do not seed very easily in India.

The name *Millingtonia* honours Thomas Millington, an English botanist of the 18th Century and *hortensis* means "grown in gardens". The tree is indigenous to Burma and the Malay Archipelago, but now grows wild in most parts of India as well as being extensively cultivated.



CORK TREE



PONGAM



THE PONGAM

PONGAMIA GLABRA or *P. PINNATA*

Punku (Tel.) ; *Pongam* (Tam.) ; *Karanj, Papar, Kanji* (Hind.) ; *Pungu* (Tel.)

IN March and April when every other tree is taking on a new cloak of rich green leaves, the richest and brightest of them all is the Pongam. For a few days or a week at the most, when the buds develop into limp, new leaves the whole tree is tinted crimson, but as the leaves grow, they acquire a lovely, vivid lime-green colour, each leaf clean and shining and the whole tree one of the freshest sights one could wish to see against the drab dustiness of roads and fields.

Recently the Pongam has been planted in numerous gardens and along countless roads and is becoming one of our most popular City trees. In the coastal forests all round India and by streams and rivers it grows wild. It is of medium size and fast-growing, with rough, grey-brown bark.

Almost immediately after the new leaves have developed the flowers bloom in great number. They could not be described as striking but the profusion of the short, white sprays half hidden amongst the leaves gives to the already lovely tree an added charm. The $\frac{1}{2}$ inch blooms are crowded along the ends of long stems which rise from the axils of the leaves. Each flower has a short stalk, a loose, brown, cup-shaped calyx and five white petals, tinged with pink or mauve. The largest petal—the standard—is hooded over the other four which are all folded together. The flowers fall before they wither and cover the ground with myriads of little white balls.

The fruit is a filbert-like, woody pod, about 2 inches long. It is mottled-buff or dark-grey and ripens just before the next lot of new leaves appear, but does not open to release the red kernel within. All the pods fall and the ground below is then covered with a crackling carpet.

The leaves are between 6 inches and 1 foot long and have five, seven or nine oval leaflets with pointed tips; each leaflet is short stalked and the leaf stems—as also the flower stems—are swollen at their base.

To ensure a good, straight bole the Pongam is usually lopped and these loppings are either given to cattle or—more often—ploughed into rice-fields as manure. The seeds give a red oil which burns well and is also used as an embrocation for skin diseases. The juice of the roots is applied to sores and is used for cleaning the teeth as it has antiseptic qualities.

Pongamia is from the Tamil name and *glabra* means "smooth and hairless."

THE INDIAN LABURNUM

CASSIA FISTULA

Amaltas (Hind.) ; *Rela* (Tel.) ; *Konnai* (Tam.) ; *Bhava* (Mar.)

THIS is without doubt one of our loveliest flowering trees. Similar in many ways to the English Laburnum, it is infinitely more beautiful. Each in its season becomes "rich in streaming gold," but the drooping flower clusters of our trees are many times longer and the individual blooms many times larger than those of their English cousin. One of the most widespread of Indian trees, it is popular all over the country, every vernacular providing a name. Many of these names refer to the long stick-like pods which appear in profusion during March and May. The Bengali name means "Monkey-sticks" and the Dutch call it "Pudding Pipe Tree"; but they have an alternative to that unromantic name in "Golden Shower." The Latin word *fistula* also means "pipe."

It is a moderate-sized, deciduous tree, growing well at any height up to 4,000 feet, but not gregarious except in districts well populated by monkeys. This is because, not only do the seeds germinate with difficulty, but most of them are eaten by insects before leaving the pod. Animals, particularly monkeys, are partial to the sweet pulp in which the seeds lie: They break open the pods and the seeds, thus liberated, fall to the ground and have a chance of germination.

The bark is greenish-grey and smooth on young trees but with age it becomes brown and rough. Between February and May the leaves get dull and ragged and many of them fall. New leaves are a lovely, tender green sometimes tinged with pink, or a rich copper colour, clothed beneath with a soft down. Until fully grown they remain pendulous and folded. The leaves are large and compound, consisting of three to eight pairs of oval 5 inch leaflets on short stems. These large leaves and also the stiff, erect branches, make the Laburnum distinct from all other Cassias which have feathery leaves and long, arched branches.

During the hot season when the long, drooping sprays of clear, yellow flowers clothe the tree in a mantle of gold, it is indeed a glorious sight. Each spray is more than a foot in length and bears on long, slim stalks, numerous, large, deliciously fragrant flowers and rounded buds. Each consists of a delicate green calyx, five sepalled; five spoon-shaped petals of unequal size and ten yellow stamens. Three of these are long and curve gracefully upwards. The next four curve the opposite way and are less than half the length, while the remaining three, are short and straight. All are crowned with large, brown anthers. The style is long and green, curved amongst the major stamens. There are two distinct varieties—one has large leaflets and bright flowers, the other smaller leaflets and paler flowers.



INDIAN LABURNUM



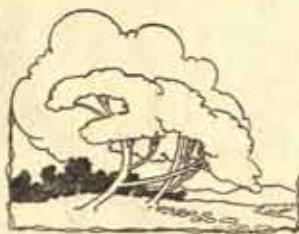
RUSTY SHIELD BEARER

At the beginning of the year the Laburnum is by no means an attractive sight. The long, cylindrical pods appear in profusion and hang like so many pipes among the nearly leafless branches. They sometimes become as much as 3 feet in length and contain large numbers of shiny, brown seeds. At first the pods are green and soft; later they turn brown and eventually become black and very hard. The pulp of these pods is used in Bengal to flavour tobacco. Taken in large doses the pulp is a strong purgative yet bears and monkeys eat it with apparent impunity. The Santals eat both flowers and leaves, although cattle or goats will not touch them. The bark is used to a small extent for tanning and dyeing and the wood makes an excellent fuel and gives good charcoal. There are many medicinal uses for all parts of the plant, including the cure of ringworm, the relief of rheumatism and chilblains, cooling the blood and as an emetic.



INDIAN LABURNUM
IN FLOWER

There is another Cassia with bright yellow flowers and although the individual flowers are very similar it would be impossible to confuse the two. At the end of the year the Siamese Cassia (*C. siamea*) produces amongst its thick, dark green foliage numerous, large spires of yellow blooms, which are followed, in a couple of months, by a crown of red-brown pods. The leaves are pinnate and the many leaflets larger than those of the Pink Cassias. It is possible to confuse the Siamese Cassia with the Rusty Shield-Bearer as the latter also bears conspicuous spires of yellow blossoms and may frequently be found in flower at the end of the year. These flowers, it will be noticed, are more of a golden-yellow, the Cassia more lemon coloured, while the leaflets of the latter are considerably larger. The vernacular names of the Siamese Cassia are *Beati* in Tamil and *Kassod* in Marathi. A third yellow flowered Cassia is the recently imported *Cassia multijuga*. The leaflets are bright green above and pale below and the flowers, borne in profusion during August and September, are typical Cassia flowers.



THE RUSTY SHIELD BEARER or COPPER-POD

PELTOPHORUM FERRUGINEUM or *P. INERME*

Iyalvagi (Tam.) ; *Kondachinta* (Tel.).



FROM my flat I look down on to an avenue of Rusty Shield Bearers and in April, when most of them are in full bloom it is a veritable road of "The Cloth of Gold." As each brilliant dome sends up its heady, Eastern perfume they are truly a delight to the senses.

The flowering period is long and variable ; one tree will be in full bloom while its neighbour has got no farther than the bud stage. I have seen one half of a tree flower for some weeks before the other half commenced ; then, when the second half was covered in gold, the first was bearing fruit. From September until the end of the year there is another, lesser flowering period and all through the year occasional trees bear a few odd blooms.

It is a tall tree, often 80 feet high, with a smooth, grey bark and a fairly spreading crown, dense and dark when in full leaf.

By the end of February the tiers of erect, pyramidal flower sprays are in bud. The several branchlets, green and brown in colour, are clustered with velvety, rust-red balls, each on a short stem. Two or three buds at the base of each branchlet then open into five petalled flowers, clear yellow, crumpled and twisted, the copper-red sepals curling back from the narrow, rust bases of the petals. The protruding stamens bear bright orange anthers. These lovely fragrant blossoms each last but a short time, falling from their calices while still fresh and daily carpeting the ground with gold.

The large copper pods develop in profusion and are nearly as conspicuous as the flowers especially during December and January when most of the leaves fall. They remain on the trees more or less until the next spring, by which time they are black and brittle.

Just before the new, bright leaves sprout, the trees are all practically bare and the transformation—in the space of a few days—is one of the annual pleasures of all tree-lovers. A week or two later the fresh, tender green has changed to a much deeper colour. The large, fern-like leaves are bipinnate, the twenty to thirty close-growing leaflets of each *pinna* being oval, leathery and set nearly at right-angles.

I know of no uses made of this tree except that the wood, although too light to be very enduring, is employed for furniture-making.

The name *Peltophorum* is from a Greek word meaning shield bearing in allusion to the shape of the pods and *ferrugineum* describes their, rusty colour. The new name *inerme* is much less descriptive, meaning “unarmed.”

CASUARINA or SHE-OAK

CASUARINA EQUISETIFOLIA

Chouk (Tam.) ; *Serva* (Tel.) ; *Chevaku* (Vern.)

THE casuarina has the general appearance of a conifer with its cord-like leaves, small cones and tall, straight stem. It is fairly quick growing, long-lived and hardy, particularly in the sea-coast areas where the loose, sandy soil is most suited to its requirements. Many plantations have been made in South India for reclaiming sandy sea shores and in those parts, the tree has now become naturalised. There also, in North Kanara and along the Coromandel coast in particular, it is extensively grown for fuel. Closely planted and kept low, it can be made into a good, dense hedge. In inland regions and in the coastal districts it is often used as a roadside or garden tree, being an extremely decorative as well as useful tree. In fact gardeners in temperate countries grow it as a hot-house plant for decorative purposes only. The wind whispering and sighing through the branches of a casuarina, can be likened to the distant murmur of waves on the shore—a soothing and restful sound.

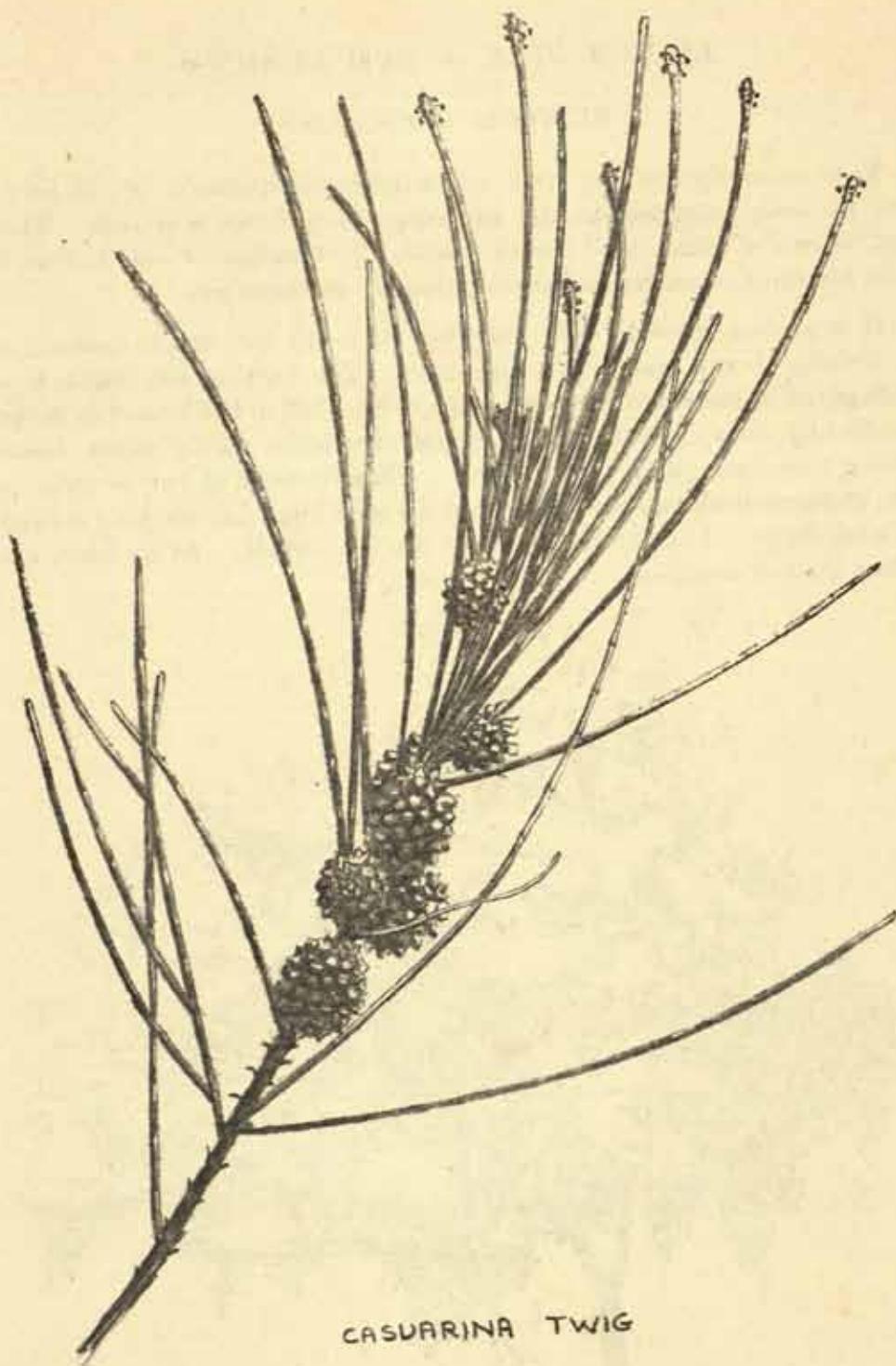
The original home of the casuarina is Australia where it is called the "Beef-wood Tree" because of the rusty hue of the wood. The name casuarina arises from the resemblance of the fine leaves to the feathers of the Australian bird the Cassowary whose scientific name is *Casurius*. *Equisetifolia* suggests that the bunches of leaves are like a horse's mane or tail.

The strong, branched trunk is clothed with rough bark which cracks and comes away in long strips. The waving feathery foliage consists of many slender, drooping, jointed branchlets, arising from rough, woody branches ; these branchlets are green, fulfil the functions of leaves and are partly deciduous. They fall throughout the year, forming a spongy carpet beneath the tree, such as one finds in pine woods.

Some authorities claim that a tree will bear flowers of one sex only and it is the exception to find both male and female flowers on one tree ; others state that it is two-sexed and the one-sexed tree is the exception. In the illustration of a twig, both male and female flowers can be seen. The flowers appear twice a year, from February to April and again six months later. They are unisexual, the staminate, or male being in cylindrical terminal spikes, the pistillate, or female, in dense heads which lie in the axils of the branchlets. These heads, which are usually seen in groups, are like small buds covered with curly, dark red fur. The "bud" swells to become a cone and the red hairs fall. The cones are about 1 inch across, round or oblong and comprised of numerous pointed segments which are not overlapping as in a fir cone.

The wood is hard and almost unworkable by Indian carpenters. It also cracks and splits easily and so, is more suitable for beams or posts than planks, but does not last long underground. The chief use is as fuel, for which a tree may be cut when 10 or 12 years old, although it is better left until about 20. The bark is astringent and used for tanning.





CASUARINA TWIG

LIGNUM VITÆ or GUM GUAICUM

GUAICUM OFFICINALE

THIS is another of our trees which attracts attention by its cool, quiet colours, in sharp contrast to the predominant yellows and reds. The dark, rounded crown of small, dull leaves frames the bunches of small, blue flowers with the restraint of an English rather than an Eastern tree.

It is a slow growing tree, reaching 30 to 40 feet when mature, usually with a crooked trunk and knotty branches. The bark of the trunk is smooth and variegated in shades of grey and beige, while that of the branches is furrowed and uniformly ashy. From these angular branches spring many branchlets, all bearing numerous, dark green leaves. These consist of two or three pairs of smooth, stemless leaflets, roundish, about an inch long, but varying considerably in size and shape. Usually the end pair are the largest. At its base, each leaf has a tiny spot of orange.





INS: | | |

DY. COWEN

LIGNUM VITÆ

At the beginning of the hot season the whole crown becomes swathed in silvery blue and throughout the monsoon many of the flower clusters remain. During the end of the year some of the trees have a second, but lesser flowering period.

As buds and newly opened flowers are quite a deep blue and old flowers fade to palest silver, the clusters present a charmingly shaded effect. Each small flower has five spreading petals surrounding ten, erect, yellow-tipped stamens.

In August the little, round berries stud the tree with gold. They appear in small clusters, first green then ripening to bright yellow and orange. Irregular in shape, they are compressed to form varying numbers of rounded wings.

A translucent green resin exudes from this tree either naturally from the trunk or through incisions. Sometimes it is obtained by cutting the tree in sections and heating the wood. Melted, this gum produces a very pleasant odour. The hard, olive-brown wood is also aromatic but this is acid and not so pleasant. The wood is extremely hard and heavy and will not float in water.

Wood, gum, bark and fruit all have medicinal qualities which makes the fact that there are no local names for the tree even more surprising.

The Latin name is derived from the Mexican name of the plant and from a word meaning "recognised in pharmacy and medicine." *Lignum vitæ* is the name of the timber, which is also known as Brazil wood. In fact the tree has many names in different parts of the world, yet our vernacular would appear to provide none at all.



THE BABUL

ACACIA ARABICA or *A. SCORPIOIDES*

Babul, Kikar (Hind.) ; *Karu-vel* (Tam.)

AMONGST other trees the Babul is not particularly conspicuous, but in the inland, dryer regions it is one of the few trees able to find sufficient nourishment to attain average height and, having established itself by arming its branches with strong spikes, it acquires protection from grazing animals, to which it affords good shade. Older trees and branches beyond the reach of animals are not thus armed. The ability of the pairs of tiny leaflets to fold flat, not only at night, but during excessive heat also endows it with a greater chance of survival as too, does its capacity for doctoring injuries to its branches by exuding a gum which coagulates rapidly and heals the wound.

It is a small or medium tree, rarely rising beyond 40 feet, with straight, fine, grey-downy branchlets. The small, golden-yellow balls appear in fragrant groups during July and November—throughout the year in some localities—and consist of numerous, tiny blossoms resting in minute calices and having distinct stamens. Half-way down the flower stalks are broad bracts or irregularly developed leaves. The narrow, stiff, leathery pods, densely lined with fine down, are from 3 to 6 inches in length and enclose about a dozen seeds, between each of which the pod is more or less constricted.

The leaves are bipinnate and the many pinnæ, each bearing numerous, tiny leaflets give the tree a delicate, feathery appearance. At the base of each leaf stalk is a long, white, ascending thorn.

Pods, seeds and young branches are used as fodder for cattle, camel and goats when grass is scarce. Most parts of the tree have medicinal uses. The bark contains a powerful, astringent acid and is used for tanning and dyeing. The gum it exudes during March and April is procured by making an incision in the bark and when the sap runs out it hardens in lumps of various sizes and may then be easily removed ; it is used as a substitute for Gum Arabic and, mixed with seeds of sesamum, is eaten by the village people. A decoction of the bark makes a soap substitute and is of healing value. The thorns are popular in offices, where they are used to pin sheets of paper together.

The Babul is common in the forests of the Punjab, Sind, Bihar and Western India, Ceylon and Burma ; makes excellent fuel and is of rapid growth, despite the fact that it needs little water.

BANYAN



BABUL



THE BANYAN TREE

FICUS BENGALENSIS

Ber (Hind.) ; *Ala* (Tam.) ; *Mari* (Tel.) ; *War* (Mar.)

WALKING in the country one day I came across a venerable old banyan tree, its pillared arms extending an offer of cool shade away from the heat and glare of the Indian sun. I wandered among the arcades and marvelled at the vast area which this one tree covered and recalled the descriptive lines—

“ Branching so broad and long that in the ground
The bending twigs take root and daughters grow
About the mother tree, a pillared shade—
High over-arched with echoing walks between.”

Then I remembered a picture once seen of a whole village settled beneath the canopy of a Banyan tree. Other memories came—legends of folklore which told of ghosts and dark spirits inhabiting old Banyan trees, but I passed those over as nonsense. Later in the day, however, I again came that way. The sun was well below the horizon and this time I saw an evil old giant, his snake-like arms extended, waiting to crush some helpless victim. A sinister atmosphere surrounded the place—no need then to recall the tales of ghosts and devils !

There are those for whom this tree, with its ability to support its growing weight by an ever-widening circle of root-like branches, represents eternal life. By them it is worshipped and special prayers are offered to it on *Vadsāvitri* day.

The Banyan is an outstanding example of epiphyte growth. A seed, ejected by some bird, may come to rest among the leaves of a palm, or other tree. Here it germinates ; long roots appear which soon thicken and strengthen and eventually strangle their host. To the Hindus this is a Holy Union—to others, probably, another story of Beauty and the Beast !

The bark is grey and smooth—usually variegated because it flakes off easily and the trunk in mature trees is never cylindrical but composed of several amalgamated aerial roots. From every branch hang clumps of brown ‘ rope ’ ; these eventually unite and on reaching the ground take root and grow into separate trunks.

These leaves are large and leathery, mostly elliptical in shape and dark, glossy green, conspicuously pale-veined. Like nearly all fig-trees, the Banyan has two large scales which cover the leaf bud. As the leaf develops the scales fall, leaving a ring round the stem at the base of the leaf stalk. Young leaves have an attractive reddish tinge.

The tree appears to bear no flowers, only fruit : Actually the flowers are concealed in the fleshy receptacle commonly referred to as the fig. These figs

are stalkless and grow in pairs like red cherries in the leaf axils. They contain numerous, tiny blossoms of both sexes and also a host of small insects. These are the 'fig insects' without which the tree could not produce seed, each species of fig having a species of wasp attached to it. The insect enters through a hole in the top and lays eggs which hatch out and mature. These new insects, on leaving their home become dusted with pollen from the male flowers. They then make their way into another fig, thus ensuring fertilisation. The figs ripen between February and May when they become bright red and are then much sought after by birds and bats.

The name Banyan, according to one authority, was given to a tree growing in the Persian Gulf, under which some *banyas* or Hindu traders had built a pagoda. To Hindus it is sacred and they object to felling it, causing great difficulty to forest officers in search of labour. Often, a seed will germinate in a cracked wall and so firm is the embrace of the roots that it is almost impossible to extricate it.

Banyan timber is porous and not sufficiently durable to be in great demand ; the aerial roots, though, provide stronger timber and are used for tent-poles and cart-yokes. From the bark and young hanging roots a coarse fibre is obtained which is used for rope-making. Bird-lime is made from the sticky, milky sap and the leaves are used as plates.



THE PEEPUL or BO TREE

FICUS RELIGIOSA

Pipal (Hindi); *Drasi* (Tam.); *Ravi, Ragi* (Tel.).

FOR antiquity and veneration the Peepul is unrivalled throughout the world. No other tree is claimed to have such long life—part of one in Ceylon, said to have been planted in the year 288 B.C., still lives and flourishes. The Prince Siddhartha is known to have sat in meditation under a Bo tree and there found enlightenment from which time he became known as the Buddha. So, from then on the tree was sacred to Buddhists. Hindus associate the tree with the three gods Brahma, Vishnu and Shiva and worship it. They also relate the legend of the Hindu boy who died during his thread ceremony and became a ghost to haunt the tree for ever after. In such veneration is it held that it is forbidden for any devotee to fell it, harm it or utilise a part of it in any manner. Even if found growing in a dangerous position or to have sprouted spontaneously in some unsuitable place, which it does very frequently, the task of removing it is given to some person of another religion. Thus, by shifting the responsibility to the shoulders of others, the faithful can witness the destruction of the sacred tree with equanimity!

As light and airy as the Banyan is dark and enveloping, the Peepul bears long-stalked, fluttering leaves, heart-shaped and terminating in a long, tapering point. In all some 6 or 7 inches long, these shining Poplar-like leaves cannot fail to be identified. Like the Poplar too these pendent leaves on their long stalks, flutter and dance in the slightest breeze. Especially charming is this sight in April when the new leaves, dark-red and shining, are scattered about the branches.

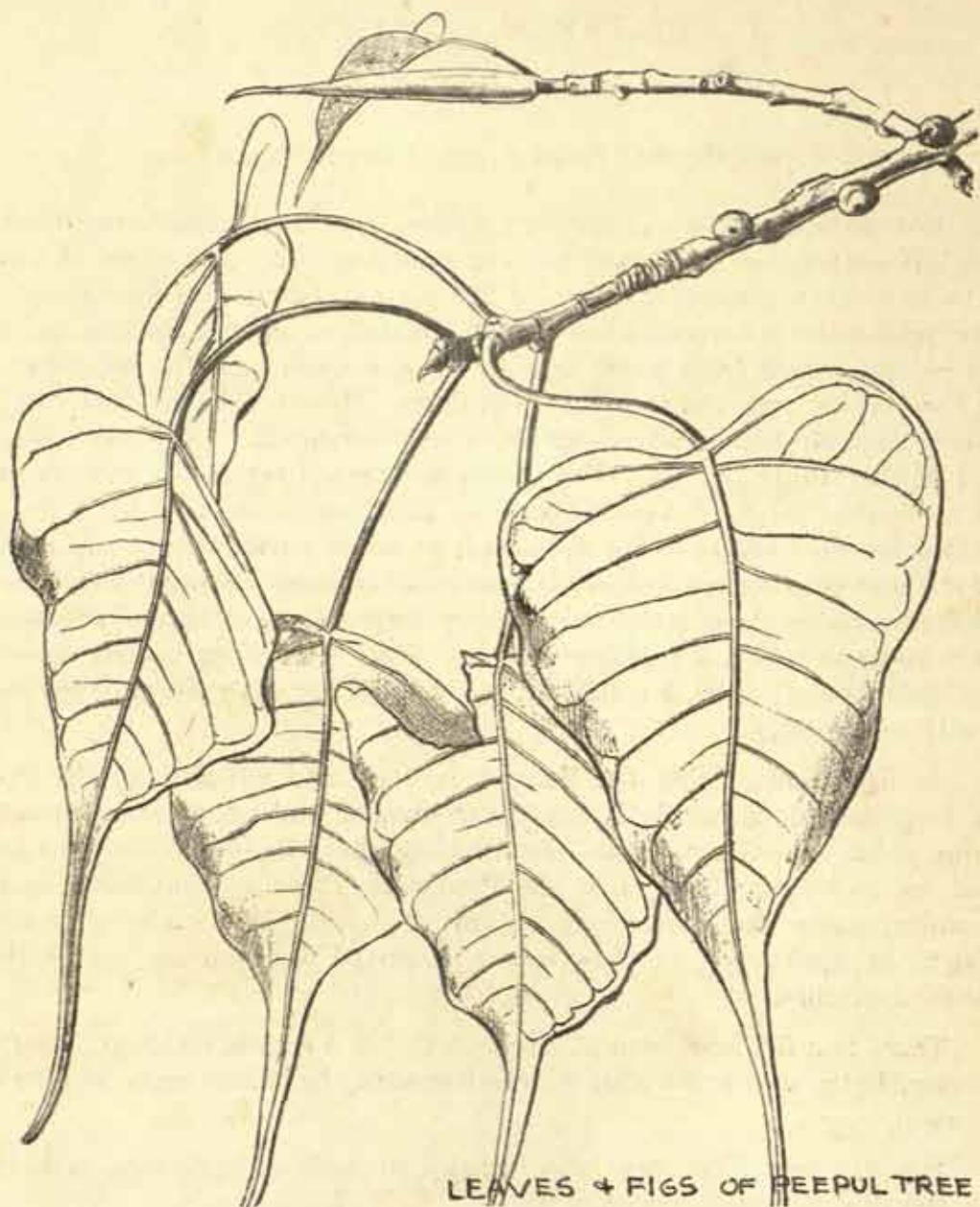
There is a fine specimen of the tree in the Victoria Gardens, Bombay; its strong, buttressed trunk and widely spreading branches make it indeed a noble sight.

Figs, the fruit of the tree, grow in pairs, concealing the flowers, as do those of the Banyan and other species of *Ficus*.

Because it is so universally worshipped the Peepul has few medicinal or economic uses. The juice of the bark is sometimes made into a mouthwash to alleviate toothache or strengthen the gums.

F. glomerata is the wild fig with the edible fruit which, although always full of crawling insects, is much relished by the country people. In the vernacular it is known as *Rumbal* and *Umbar*.

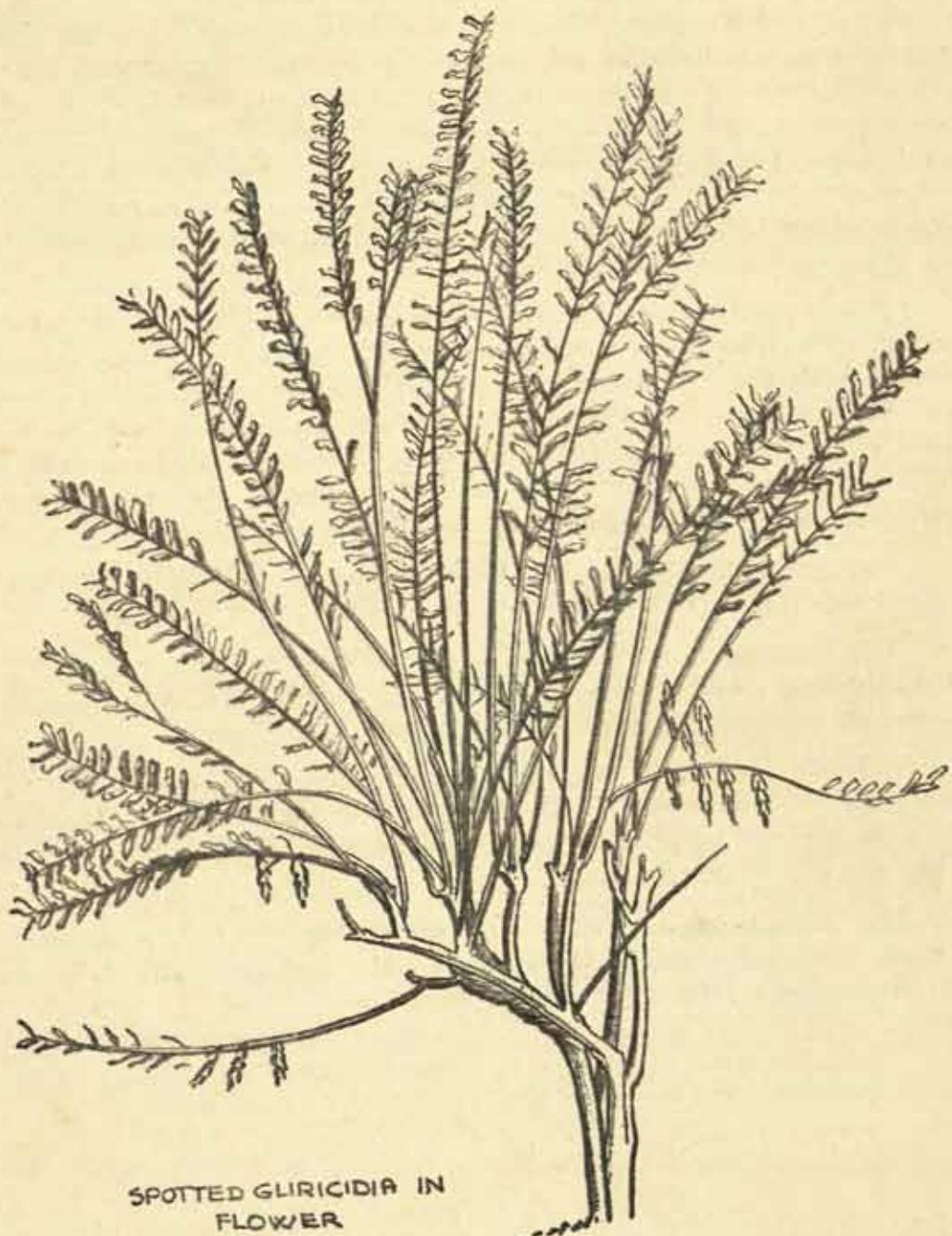
F. carica known as *Anjir*, bears the cultivated fig which from time immemorial has been one of the most valued of fruits. Its goodness is mentioned in the Old Testament and the "Odyssey"; but it is agreed that those grown in India do not compare with the richly flavoured figs from Italy.



LEAVES & FIGS OF NEEM TREE

F. elastica (*Bor* in Bengal) is the india-rubber tree, thus named when it was discovered that the latex has the property of erasing pencil marks. Its distinguishing marks are the close, parallel, straight nerves of the leaves and the huge, leaf-like appendages at the base of their stems.

MADRE or SPOTTED GLIRICIDIA
GLIRICIDIA MACULATA or *G. SEPIUM*
Madre, Madura (Vern.)



THIS is a charming tree, its long sprays of pale pink flowers rather reminiscent of the Cassias. As recently as 1916 the first specimen was brought to India from Ceylon where it was introduced in 1899. Its native country is South America, but now it is quite common in Indian gardens.

Left unpruned the *Madre* develops into a fine spreading tree, its long grey branches sweeping out and downwards in graceful arches. But these branches unfortunately bear such a profusion of leaves that they are often broken by the weight if the tree stands in a spot unsheltered from the wind. So it is that most garden trees are pollarded. This changes the form of the tree entirely. An unpruned tree will bear from its main branches numerous flower-bearing branchlets up-standing 3 or 4 feet each clothed with a dozen or so flower sprays. From the scars of the pruned tree rear several, very long branches which, for nearly their entire length, will be swathed in clumps of pink bloom. The flowering season is January and February, and before that most of the leaves fall, enough however, remaining to show off the delicate paleness of the blossoms. To be seen at its best a *Madre* should really have a dark background—an evergreen for instance.

Plants sometimes flower when only a few feet high and are very quick growing. The 6 inch flower sprays are tightly covered with pale purple-pink blossoms with the "keel and wing" formation of several flowers described here. One petal is large and back-curving and within the two sickle-shaped wing petals is an incurved keel petal. The upper petal is smudged with yellow. The fruit is a long flat "bean" and in March, when the whole tree is draped with these pendent green pods the effect is quite charming.

The leaves are about 1 foot long and divided into eight pairs and one terminal leaflet, pale green, soft and furnished above with fine down.

The tree has no economic or medicinal uses in India, not having been sufficiently long established but it is often planted for its beauty and because it makes an excellent shade tree for nine months of the year.

A white variety, *G. alba* has recently been introduced. My opinion of the only one I have seen—a flowering sapling—is, that as the blooms are a pure white and are borne in as great a profusion as those of its pink relative, the tree has a very definite charm.

The name *Gliricidia* means "rat destroying" and it is claimed that the seeds have this power. *Maculata* means "spotted" and refers to the small glands seen on the under sides of the leaves.



INS:

D.V.COWEN

MADRE



P. INS:

D.V. COWE

FLOWER AND FRUIT OF THE DRUMSTICK TREE

DRUMSTICK TREE or HORSE RADISH TREE

MORINGA PTERYGOSPERMA or *M. OLIEFERA*

Soanjna, Suhujna (Hind.) ; *Morunga* (Tam.) ; *Shakta* (Mar.)

THIS is a pretty tree, the delicate tracery of its much-divided leaves giving it an airy, graceful appearance. It is very common, particularly in the Bombay Presidency where it may be seen in every back garden, waste plot or village. In the Western Himalayas and Oudh it grows wild.

The thick, grey bark is furrowed and comes off in corky flakes. The main flowering season is from February to April but many trees will be seen in bloom from September onwards. The creamy white flowers appear in large, loose clusters, sometimes covering the whole tree in a white froth. Each individual flower is small ; the stem bends sharply at the tip and nine of the ten long petals fold back around it. Six unequal stamens bear bright orange anthers. Old flowers turn rather yellow and, together with the new white flowers and the pale green and white buds, the whole spray is a picture of delicate beauty, its sweet honey-scent an added attraction. The fruit starts as a pinkish, twisted tube and takes about three months to attain its full length of anything up to 20 inches, when it is bright green and ridged and contains many winged seeds. This extraordinary pod gives the tree its name of Drumstick and its seeds are a popular ingredient of curries (the drumstick curry of Madras). Boiled it is said to have the flavour of asparagus, and is often pickled.

The distinctive leaves are divided and sub-divided, the ultimate segments being only $\frac{1}{2}$ to $\frac{3}{4}$ inch long. They are oval, borne on tiny stalks and a clear green colour. Each leaf is as much as two or three feet long but the pinnae and leaflets are rather widely spaced and the whole does not form a compact and symmetrical leaf. It is like the leaf of the Persian Lilac on a small scale. Pinnae, secondary pinnae and leaflets are all opposite.

As well as having an edible fruit the *Moringa* is useful in many other ways. The scraped root is an excellent substitute for horse-radish ; from the wood exudes a gum which is at first white but later turns yellow and then dark brown. It is used in native medicine. The seeds yield an oil very similar to the *ben* oil of watchmakers. Actually *ben* oil is the produce of another species, *M. aptera* of Africa. The oil of our tree is used in India for fine machinery and by perfumers as it holds odours which are inclined to be fugitive, but it is not exported and is not as largely used as it might be.

From the bark is obtained a coarse fibre, useful for making mats, paper and cordage.

The branches are lopped for fodder and much liked by domestic animals, especially camels.

The name *Moringa* is from the Tamil and *oliefera*, which is another scientific name for it, means "oil-bearing."

THE BEAD TREE, PERSIAN LILAC or PRIDE OF INDIA

MELIA AZEDARACH

Vaymboo (Malayalam); *Drek, Bakain, Malla Nim* (Vern.);
Pejri (Mar.); *Mallay Vembu* (Tam.)

THE lovely Bead Tree is somewhat similar to the Nim in appearance and takes the place of that tree in the Northern parts of India. Both have compound leaves with narrow, serrate-edged leaflets terminating in long points but those of the Bead Tree are smaller, lack the sythe-like curve and are subdivided at the base into several pinnæ bearing five or seven leaflets. It is a medium-sized tree, fast-growing and attaining up to 40 feet in height in a few years, but its beauty is short-lived; at the age of about 20 years it commences to die off. The bark is dark grey-brown cracked vertically by long furrows.

In the winter the leaves fall and the tree is naked except for the masses of cherry-like fruits, which, when ripe and lusciously golden, attract bulbuls and other birds in large numbers. By March the spring foliage appears, followed immediately by the beautiful sprays of tiny, lilac blooms. Growing high up on the tree, they draw attention to their presence by their delightful fragrance—powerful yet delicate. One looks up to see a multitude of little nodding blossoms loosely clustered on long-stemmed sprays. Each flower has five or six narrow mauve or white petals which on opening reveal a deep purple tube; this is actually a cohesion of the stamens. Recently I came across a flowering Bead Tree which bore from the trunk—only a foot or two from the ground—several new leaves and quite large clusters of flowers; but this is most unusual.

After the monsoon the fruits form and those which are not eaten by birds eventually become very wrinkled. Each fruit contains five seeds which, having a natural perforation through the centre, make ideal beads. Because of this characteristic the tree has become a popular exotic in Southern Europe where the beads are made into rosaries. Although principally an ornamental tree it has several uses. Large doses of the fruits are poisonous but, combined with the leaves they have a certain value as poultices in cases of headache, or neuralgia. A valuable oil is procured from the roots and the timber, though not often used, is handsomely marked and easy to work.

The Bead Tree is indigenous to parts of N. India and Burma and is now cultivated in all the sub-tropical regions of the world.

Melia is the Greek name of the Ash, but is not very appropriate as there is only superficial resemblance between the Bead tree and the Ash. *Azedarach* is from the Persian *azad-darakht*.



INS:

D. COWEN

BEAD TREE



INS: 1 1 1 1

D.Y.COWEN

UMBRELLA TREE

UMBRELLA TREE, PORTIA TREE or INDIAN TULIP TREE

THESPESIA POPULNEA

Bhendi (Vern.) ; *Parsippu* (Hind.) ; *Poresh* (Beng.) ; *Porsung, Puvarassu* (Tam.)



THE compact, clean-cut crown and straight bole of the Umbrella Tree often give it the appearance of a child's model tree, conventionally carved and painted. This neatness makes it most suitable for formal park planting, but because of the close-growing foliage it is often used as a shade tree, too. Common along the tropical shores of Asia, it does not thrive so well at any great distance from the sea. In that the flowers are large and cup-shaped they resemble the tulip, but the crinkled, fragile quality of the petals and their ephemeral life bear no resemblance to that plant at all. Appearing all through the year, singly or in pairs, they are a bright, lemon-yellow with patches of blood red at the base of each of the five petals. The whole flower has the appearance of having been so crushed and twisted in the bud that it was impossible for the petals to smooth themselves out again. From the pistil,

rising like a wick in the centre sprout numerous white stamens, conspicuous because of their deep-yellow anthers. Having the same appearance as the pistil and stamens of the Hibiscus it was once thought that this tree was of the same family.

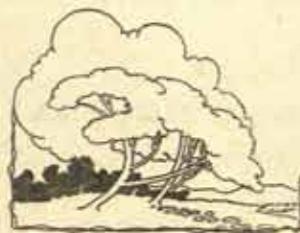
Although evergreen, many of the leaves fall in February. Withering leaves acquire the same lemon-yellow tint as the flowers and at first glance one gets the impression the tree is in full bloom. The leaves are heart-shaped and pointed, with conspicuous pale nerves radiating from the base. They are from 2 to 5 inches long and nearly as broad, borne on brown and green stalks a couple of inches in length.

The fruit, when young, sits loosely in the enlarged calyx but later swells into a small green apple which eventually turns black.

It is an extremely useful tree; from the inner bark is obtained a tough fibre; bark and wood contain tanin and yield a red dye, and the wood, retaining its qualities in water, is ideal for boat and house building.

From the flowers and fruit a yellow dye is obtained and the fruit juice, applied externally, in a cure for scabies and other cutaneous diseases. A tonic is concocted from the roots.

Thespesia is derived from the word "Thespesios" meaning "divine" and the tree is named thus because it is frequently planted near churches and temples. *Populnea* means "having leaves like a poplar".



THE MOHWA or INDIAN BUTTER TREE

BASSIA LATIFOLIA or *MADHUCA INDICA*

Mohwa (Hind., Mar.) ; *Ippa* (Tel.) ; *Kat-illipi* (Tam.)

THE Mohwa is one of the most important of Indian forest trees, not because it may possess valuable timber—and it is hardly ever cut for this purpose—but because of its delicious and nutritive flowers. It is a tree of abundant growth and, to the people of Central India, it provides their most important article of food as the flowers can be stored almost indefinitely. Not a tree of coastal districts, it prefers the dry, rocky hill regions and there, where it is so much cultivated, it also comes up self-sown.

The tree was named after Fernando Bassia, one time curator of the Botanical Gardens at Bologna. It is large and deciduous with a thick, grey bark, vertically cracked and wrinkled. Most of the leaves fall from February to April, and during that time the flowers appear. They hang in close bunches of a dozen or so from the end of the gnarled, grey branchlets. Actually the word hang is incorrect because when a bunch is inverted the flower stalks are sufficiently rigid to maintain their position. These stalks are green or pink and furry, about 2 inches long. The plum-coloured calyx is also furry and divides into four or five lobes ; within them lies the globular corolla, thick, juicy and creamy white. Through small eyelet holes at the top, the yellow anthers can be seen. The stamens are very short and adhere to the inner surface of the corolla ; the pistil is a long, protruding green tongue. It is at night that the tree blooms and at dawn each short-lived flower falls to the ground.

A couple of months after the flowering period the fruits ripen. They are fleshy, green berries, quite large and containing from one to four shiny, brown seeds.

While there are still flowers on the tree the new leaves sprout ; rising in close whorls from the tips of the branches, above the flowers, they are lovely shades of rust and crimson. The tree at this time is extremely decorative. Tiny leaves are furnished with soft down but they soon become smooth and polished looking and later turn dark green.

The gathering of the edible Mohwa flowers is an important business to the country people. Below the tree the ground is cleared and swept and at dawn the families, who have been camping near by, sweep up the blooms and put them out to dry on hard, flattened earth, near their shelters. The average yearly yield of a tree is $2\frac{1}{2}$ maunds. Properly prepared the flowers are very tasty—something like pressed figs ; they are often mixed with other food, with sal seeds or leaves of other plants, or they can be made into puddings and sweetmeats : Sugar can be made from them too, or they can be fermented and distilled into a spirituous liquor. This is an extremely strong drink, rather like gin to taste but spoilt by its powerful and unpleasant odour.

The fruits too, both ripe and unripe, are valuable, all parts being used. The outer coat is eaten as vegetable and the inner one dried and ground into



MOHWA

meal. A thick oil is expressed from the kernels, which, being yellowish, gives the name of Butter Tree. It is largely used by the jungle tribes for cooking or else sold for making soap and candles. The residue makes a good manure.

Animals, particularly deer and bears love the fallen flowers and will come for miles on the chance of getting past the vigilant night guards and making a meal. Birds, too, enjoy them and peafowl can often be seen around the trees at sunset and dawn. Many a beast has lost its life by a bullet, through its passion for the Mohwa flowers.

Cut flowers stems and branchlets exude a thick, milky sap which is extremely sticky, but I do not know of any use to which it is put. Many plants with a milky secretion are poisonous but that is certainly not the case with the Mohwa.



INS.

DXLOWEN

MOHWA



INS.

DR. OWEN

EASTER TREE

THE EASTER TREE or CONESSI BARK

HOLARRHENA ANTIDYSENTERICA

Kura, Kurchi (Hind.) ; *Vepali* (Tam.) ; *Dowla, Indrajau* (Bom.)

THE Easter Tree is not a garden plant but can be seen in abundance in any of India's and Burma's forests. Personally, I think it would make a charming garden tree, being of small or medium height, having attractive, rich green foliage and decorating itself with hundreds of little, white blooms for a couple of months every year after it reaches only 8 or 10 feet in height.

The bark is pale grey mottled with brown, rough and cracked.

The oval leaves are quite large—between 6 and 12 inches—pointed at the tip and wedge-shaped at the base. They grow opposite on short stalks and are marked with long, arched veins.

The full clusters of lightly scented flowers appear from about March to May and are usually blooming well at Easter, when they are plucked for church decoration. Each waxy, white flower stands on a pale, slim stalk. From a tiny, deeply-cleft calyx emerges a slender, narrowing tube, often tinged with red ; this opens into five smooth petals, round-ended and overlapping slightly to the left, the whole measuring about 1 inch across. The stamens are not visible. The fruit is about 1 foot long, narrow and slim and contains cinnamon-brown seeds, each with a tuft of silky hair at the upper end. These seeds are bitter and have an unpleasant odour.

The Easter Tree is one of our most important forest trees, being the last to disappear in denuded tracts and the first to come up on waste land. This is probably because it bears flowers and seeds abundantly and when quite young and also coppices well, sending up strong shoots even from burnt land. So it is useful for paving the way for more tender and slow-growing trees.

The bark, known as *Kurchi*, has tonic and astringent properties but its reputation is principally as a cure for dysentery. Remedies for fevers, piles, dysentery and worms are made from the seeds. These are known as *Indarjao* and for several centuries have been employed pharmaceutically. Decoctions from the roots are also used as a cure for dysentery.

In Assam, where the tree grows to a greater height, the pale wood is used for making furniture ; elsewhere it is used for small carved articles, for turnery and beads.

In the past there was some confusion between the Easter Tree and another species called *Wrightia tinctoria*. In general appearance, bark and leaf the two are similar but, except for the fact that the flowers are small and white they have little in common. Apparently the country people mixed them up, too, as many vernacular names are common to both. One of these names is *Dhudi* and it is applied to *Wrightia* because of the interesting preservative property of the sap. If a few drops of the sap are added to milk the milk will remain fresh without the necessity of keeping it on ice, the taste remaining unaltered.

SCARLET CORDIA or ALOE WOOD

CORDIA SEBESTENA

Virigi (Tel.)

WE have many indigenous Cordias in India, but the loveliest of them has its home in Cuba and was imported to this country many years ago because of its ornamental value. The derivation of the name *sebestena* is rather involved. It means having fruit like *Sebestens*, which word is derived from the Persian *Sapistan* and is the name of an allied species grown round the town of Sebesta. The name *Cordia* honours Valerius Cordus, a German botanist of the 16th Century.

Here we find the Scarlet Cordia as a small tree or garden shrub, but in its home forests it reaches 40 or 50 feet. Small or tall, it always has a short crooked trunk, wide in comparison with the height. The bark is brown and ridged.

Practically throughout the year the clusters of brilliant, bell-like flowers, scattered amongst the deep foliage, gladden our eyes with their rich hue—a clear, true scarlet. Each blossom is about $1\frac{1}{2}$ inches across. A finely pleated tube is inserted neatly into a long olive-brown, felt calyx. The tube opens out into six rounded petals, deeply crinkled and pleated. Up to a dozen blooms may be found in one close cluster.

The fruit is distinctive—a pure white drupe, enclosed in the remains of the calyx.

Both to look at and to touch, the leaves are unusual. They are large ovals, blunt at the apex and very deeply indented by the veins which, on the under side, form hard ridges. The colour is dark green, especially dark in older leaves and the texture as harsh as sandpaper. Even young leaves, although limp, are rough.

C. myxa, *Lasora* and *Bhokar* in Hindi, is the best known of our native Cordias and produces attractively fragrant, white flowers in March and April. This is the flower which was formerly known among medical writers as the Sebesten. It is a fair-sized, deciduous tree with rough, grey or brown bark, and harsh, leathery, oval leaves. The flowers lie in a cup-shaped calyx and have five curling, white petals, revealing the long stamens. The fruit is like a pale cherry and develops in stalked clusters. The nut is edible and tastes like a filbert and the pulp, which has a disagreeable smell, is transparent and viscid and employed as bird lime. Both parts of the fruit have medicinal qualities. The wood, despite its softness, is strong and durable and is said to be one of the timbers used to make Egyptian Mummy cases. It is also one of the better woods for the purpose of procuring fire by friction.



D.V. COWEN

INS.

SCARLET CORDIA



INDIAN JUJUBE



MAST TREE

INDIAN JUJUBE

ZIZYPHUS JUJUBA

Ber (Hind.) ; *Ellandi* (Tam.).

THIS tree is somewhat difficult to describe as it varies so much—not only in size but in the colour of the leaf and in the size and shape of the fruit. Sometimes the spines at the base of the leaf stalks are in pairs, sometimes singly and frequently absent altogether. But once the leaf has been examined and the angular, twiggy formation of the branches observed, recognition in any of its forms becomes quite easy.

It is described as a small to medium tree, but one has been recorded which reached a height of 80 feet. At the other extreme it is often met with as a scrubby, prickly growth straggling along roadsides or in waste land alongside the common Lantana.

The thick bark is very dark grey with irregular cracks. In well-grown trees the branches sweep gracefully downwards and, being almost evergreen, the tree is always attractive. The small, scattered leaves do not form a very close crown so the Jujube does not include shade among its many uses.

Two short spines usually appear at the base of the leaf-stalks especially on the flower branches ; one is straight and the other curved. In cultivated trees these are sometimes absent. The leaves are from one to three inches in length, oval and with three long veins running from the base. Above, the colour is darkish green ; underneath either tawny, buff, cream or silvery-white and like suede to the touch. Occasionally, particularly on cultivated trees the under side of the leaf is pale green, but the characteristic vein pattern and the way the leaves grow alternately from zig-zag twigs establishes their identity without much doubt.

The flowers clustering on slim stems round the leaf stalks are very tiny. From wee, globular buds five triangular petals open forming a multitude of pale green stars. In most flowers when the stamens are the same number as the petals they grow beside the middle of each petal, but in the Jujube the stamens lie between the petals and often below each stamen, is a small ladle-like appendage. Some varieties bear very long flowering branches each with numerous side branches and myriads of clustered flowerlets. Flowers appear around April, earlier on some trees and are considered by many people to have a most offensive odour. They are followed by the ovoid fruits which, within a tough thin skin contain a dryish pulp and a hard stone. Like other parts of the tree these fruits vary considerably. They are edible ; the pulp is eaten cooked with sugar when it is very pleasant and the kernel is eaten raw. The wild fruit is mostly used for making *sherbert* and is widely sold in the market, when ripe—a favourite with all Indian students.

The Jujube is an important tree in the dry regions as it grows readily and quickly on poor ground, furnishes good timber, excellent fuel, material for fencing in its branches, fodder for camels and goats and fruit for man. Many parts have medicinal uses and the plant is one of those on which the eri and tasar silk-worms feed. It is one of the best trees in the Punjab for the lac insect. The work of these insects makes a fascinating study. They live on the tender branches of certain trees, sucking the juice and forming a continuous incrustation of an orange-red, resinous substance. These insects occur naturally but, of course, are extensively cultivated because of the value of their secretion. Previously lac was used for dyes but since the discovery of aniline dyes it has been of much less value. Now the resin is used. Purified, it becomes shellac, which comes in various grades, the lowest making sealing wax and varnishes ; the higher, gramophone records, polishes, lithographic-inks up to fine lacquer work. Other trees on which the lac insect feeds, are Flame of the Forest, Peepul, Rain Tree and Mango.

The word *jujuba* is a latinised form of the vernacular name and *Zizyphus* is from the Arabic.



THE MAST TREE

POLYALTHIA LONGIFOLIA

Devdar, Ashoka (Hind.) ; *Assothi* (Tam.) ; *Choruna* (Mal.)

THE Mast Tree is usually seen as a lofty column, infinitely graceful with its downward-sweeping branchlets and shining, green foliage ; but sometimes wide-spreading slender branches issue from the straight trunk and form a compact symmetrical crown.

The bark is smooth and dark greyish-brown. Flowers appear during March and April but adjacent trees do not all flower at the same time. For a short period—two or three weeks only—the tree is covered with a profusion of delicate, star-like flowers, which, being palest-green in colour, give the tree a peculiar hazy appearance. They grow in clusters from small protuberances all along the dark branchlets. Each flower, borne on a slim, green stem has a tiny calyx and six long, narrow, wavy petals arranged in two sets of three. The stamens are packed tightly together in a small, pale green dome. Every flower produces several egg-shaped fruits, each on a short stalk and containing one seed. Bats and flying foxes love these fruits and clamorous, squealing throngs will cover a tree during the evening, leaving in the morning the nut-strewn ground as evidence of their orgy.

The leaves are somewhat unusual in form. Up to 9 inches in length they are lance-shaped, bright, shining green and wavy-edged. The tree is at its most attractive when the new leaves are appearing ; the contrast between the deep-green of the old leaves, the yellow-green of the half-grown leaves and the rusty tinge of the limp new ones being particularly striking. It is held in great esteem by Hindus who plant it near their temples. Having light and flexible wood, the tall, straight trunks were ideally suited to the making of masts in the days of sailing ships.



Festoons of leaves are often used to make arches or are strung across doorways during religious ceremonies and leaves, in conjunction with various flowers, are frequently seen as a decoration.

Polyalthia is from two Greek words "polys" and "altheo" meaning "much" and "to cure" and refers to supposed medicinal qualities. *Longifolia*, in Latin, means "long-leaved."



PAPAYA or PAPAW

CARECA PAPAYA

Pappali-Marum (Tam.); *Papaya, Papita* (Hind.)

ERRONEOUSLY referred to by many people as a palm, the Papaya should really be described as a giant herbaceous plant. It is short lived and of exceedingly speedy growth, bearing fruit within a year of planting and continuing to bear them in such abundance that thinning is frequently necessary.

The Papaya is a native of tropical America but is now common in most parts of the East. A small, soft-wooded tree, it bears huge, palmate leaves on long, hollow stems, forming a palm-like tuft at the top. The bark is smooth, but marked by the conspicuous scars of fallen leaves.

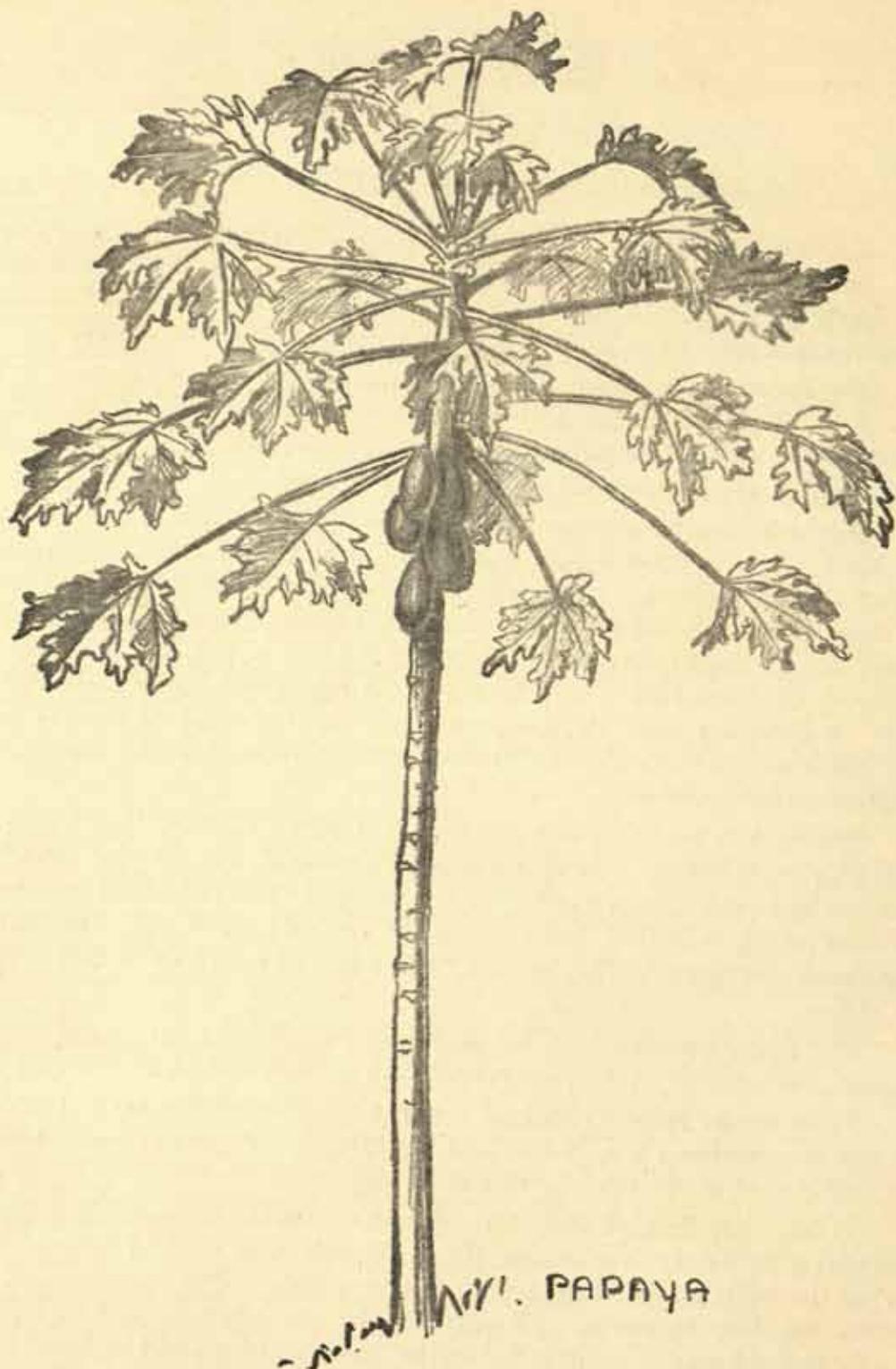
Male and female flowers grow on different trees and it is necessary to have trees of both sexes before the female will bear fruit. Hermaphrodite Papayas have been known producing both male and female flowers and bearing good fruit and it has been recorded that trees have changed their sex passing through an hermaphrodite stage. The flowers are a pale-yellow, male ones growing in tight clusters of tiny blossoms pinned closely on to long, drooping stems. A flowering male Papaya is a lovely sight, dozens of creamy sprays cascading from amongst the leaf stalks. Female flowers are in short clusters of slightly larger blooms.

The fruit is generally like a melon. Within a smooth, thin, green skin, which later turns orange-yellow, is a mass of succulent, salmon-pink flesh. This encloses a large, sometimes five-angled cavity, to the walls of which are attached numerous round, wrinkled, black seeds, the size of a small pea—the best fruit being bland and sweet. They should be plucked as soon as the skin begins to turn yellow.

The large, smooth 1 to 2-foot leaves are divided into eight crowded segments, oblong and pointed, some being sub-divided and all very deeply lobed.

From unripe fruit is obtained a milky latex which has several medicinal uses and is considered one of the best vermifuges. Papain is made from this latex and is used in the manufacture of chewing gum.

It has been claimed that this milky juice has the extraordinary property of hastening the decay of muscular fibres. Tough meat steeped in water with a little of the milk added will become tender within a few minutes and in 10 minutes will drop to pieces. All parts of the tree are supposed to have this property and old pigs or poultry, fed on the leaves and fruit will be found to have tender and succulent meat, but if left, this meat will quickly putrify. Even the vapours of the tree are claimed to separate muscular fibres in this way and joints hung amongst the leaves for a few hours will become tender. Meat wrapped in a leaf and roasted will be greatly improved. My own experiments suggest that these statements are somewhat exaggerated. It is undoubtedly



true that meat steeped in water and papaya juice becomes tender but I did not find that it falls to pieces.

The fruit is used in curries and also preserved and pickled.

The negroes of the West Indies used to wash their clothes with Papaya leaves instead of soap. This soap-like quality is not exclusive to the Papaya but is possessed by several trees, the Soapnut being perhaps the best known.

THE BANANA TREE

MUSA SAPIENTUM

Valie (Tam.) ; *Kayla* (Hind.) ; *Kach-kula* (Beng.) ; *Vala* (Mal.) ; *Kela* (Mar.)

THIS extensively cultivated plant has been common in all tropical countries for many, many years. It was certainly known in ancient times as the name *Pala* given in one description is identical with the Malayalam name of *Vala*. It is herbaceous, which means that it does not form a woody stem and it is also easily cultivated. There are about thirty species of *Musa*—all growing best in hot, damp atmospheres. Plantain is the name given to forms of the species itself, which are cooked before being eaten. A sub-species is the source of the fruit we know as banana, which can be eaten raw. The former is of greater importance as an article of food.

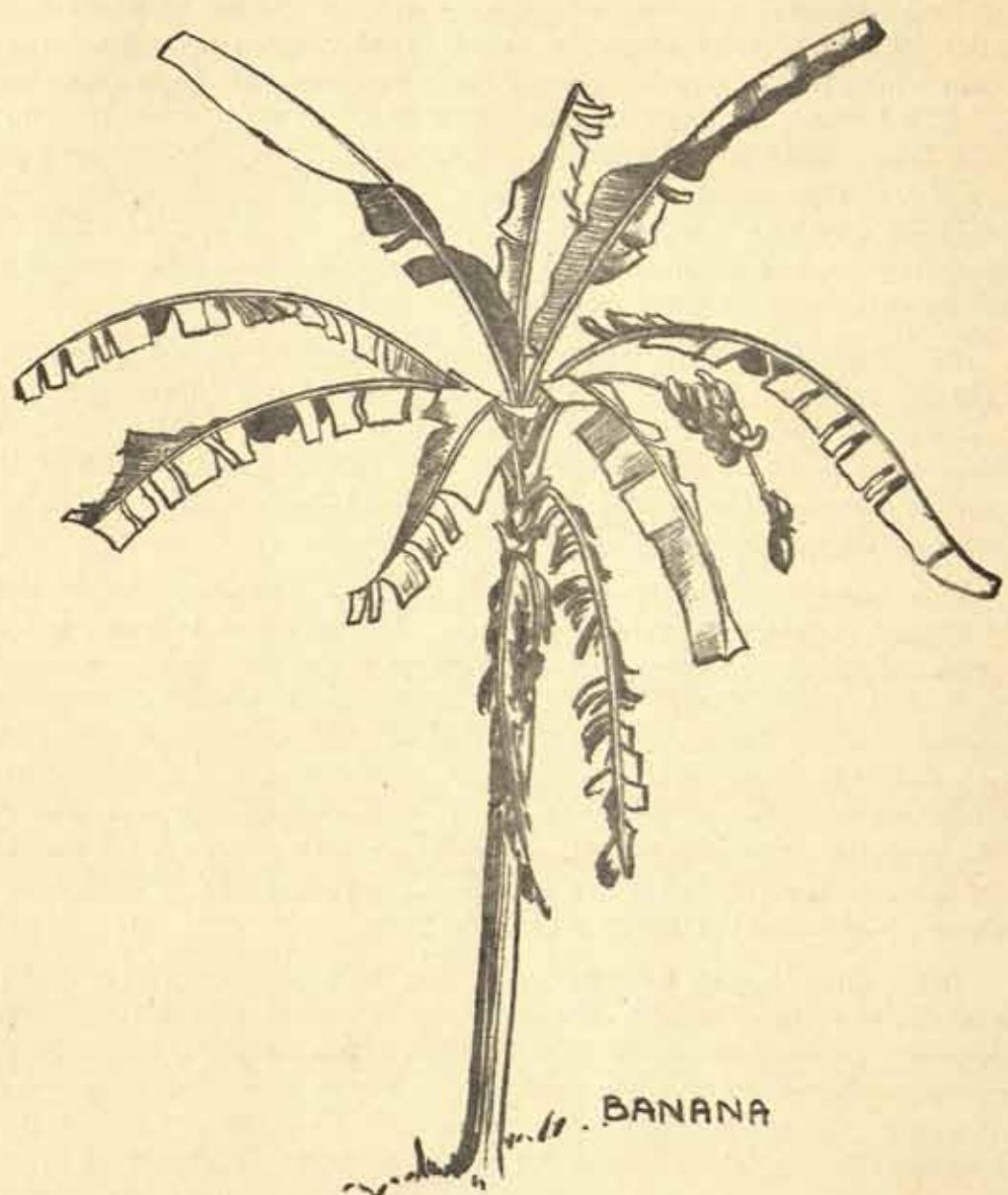
To ensure good fruit and a long life, the tree should be cut down immediately after the fruit is gathered. New shoots will spring up and bear fruit and this can be continued for as long as 20 years. There are many varieties, some having short "fingers," others long; some thin, others thick. Colours vary from bright, golden-yellow to greenish-yellow and red; skins and flavours also vary considerably.

It is never very tall, is unbranched and with the stem thickly clothed in the ragged, papery sheaths of old leaves. The leaves and flowers rise in a tuft from the summit in a similar way to palms. The gracefully arched leaves are very long and oblong, bright green and, except when quite new, split horizontally to the centre rib in several places. The lowest and oldest leaves are papery-edged, ragged and unattractive. The new centre leaves are lovely, delicately veined with close, parallel nerves at right-angles to the main rib, which, like the stalk, is often pink tinged. Few people with an eye for colour could pass a banana tree in full sunshine without noticing the brilliance of the translucent leaves and the depth of their shadows.

What appears to be the stem is actually only the closely enveloping leaf sheaths which form a hollow tube. At the flowering period the true stem develops and grows through this tube, emerging as a strong, thick, stalk which droops under the weight of what appears to be a huge bud, often purple or other bright colour. This is in fact a series of bracts, in the axils of which cluster the inconspicuous yellow-white flowers which are arranged in groups of male and female, the former being at the base. As each bract opens the flowers are revealed and within a very short time they turn into a half circle of tiny bananas. Then the bract falls and the next one on the opposite side starts to unfold.

The fruits, rising in close whorls round the stem, are oblong and obscurely three to five cornered with numerous seeds buried in the fleshy pulp. Unripe, they are green but later change to golden-yellow or red.

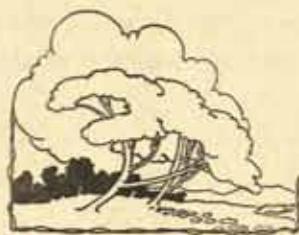
The banana being an emblem of plenty and fertility, is invariably used in native festivals. During marriage ceremonies, stems, laden with their branches of fruit, are placed at the entrance of the house and the leaves, together with brightly coloured materials, are often seen decorating temporary erections at festival time.



The unripe fruit is a profitable article of commerce. Cut in slices and dried in the sun it makes a good preserve being full of saccharine matter. Theophrastus in his writings alludes to a fruit, supposed to have been the plantain, which served as food for the wise men of India. Thus the banana received its name *sapientum*.

From some species a fibre is obtained which makes an excellent substitute for hemp in linen thread ; fine grass cloth is woven with it. The leaves are invariably used at large Hindu parties, as plates for serving food. Altogether this is a most useful plant—in fact there is only one other which has greater economic value and that is the coconut.

There is a wild variety, found on rocky hillsides and in scrub jungle, which never reaches more than a few feet in height. The leaves are used as plates by the country people and they also like to gather the fruit and cook it as a vegetable ; but monkeys also find the fruits make a tasty meal and, with their usual cunning, get there first.



PALMS

PALMS! What pictures does the word conjure in the mind! Warm, tropical nights ; slender coconuts gently waving their plumed heads against the stars ; perhaps a moon, large and brilliant, gleaming coldly on each bending frond, obscuring in contrast the dense, nut-laden hearts. That is the popular conception of a tropical coast and one of the few conceptions justified by fact. So soothing, almost so intoxicating, is the restful, moonlit beauty of a palm grove by a gentle sea that one has difficulty in differentiating one's sense of beauty from sentiment. Thinking beyond moonlight, to what do our minds turn ? Coconuts ? Dates ? Toddy ? Betel-nuts ? All from palms, but each palm so different and each with such a wealth of interesting information. To the country people of India there are no more useful plants—every part has its value. Fruits are edible or give an oil valuable in the making of soap and candles—a profitable export ; leaves are used to make baskets, thatch and books ; the wood is used for building and from a large number of palms is obtained the sweet juice which makes toddy, arrack and sugar. In addition to furnishing food, shelter, clothing, timber, fuel, fibre, paper, starch, sugar, oil, wax, wine, tannin and dyes there are hosts of minor products.

Nearly all Palms are unbranched—a slender, cylindrical trunk, circled by the bases of fallen leaves—terminated by a tuft of divided leaves. Flowers are male and female, rising in sheaths from the axils of the leaves.

Five of the commonest Palms are here described—the Coconut, the Palmyra, the Date, the Betel-nut, the Fish-tail and one more recently introduced species, the Royal Palm has been included because of its popularity as a City Garden plant.

THE COCONUT PALM

COCOS NUCIFERA

Naril (Hind. and Mar.) ; *Narikel* (Beng.) ; *Tenga* (Tam.) ; *Nari Kadam* (Tel.)

ORIGINALLY from the Cocos Islands, the Coconut Palm is now cultivated in all the damp, hot regions of Asia, especially in low, sandy situations near the sea. One of Natures most valuable gifts to the poor, its uses nearly equal those of the ubiquitous bamboo and as a commercial proposition, it is of greater value than most other plants.

It is a tall, unbranched tree with thickened base and terminal plume of large, pinnate leaves. Soft-wooded, it is capable of bending to a considerable degree and is usually found leaning into the prevailing wind. All the way up the trunk can be seen the ring-like scars of fallen leaves—a characteristic of all palms. The leaves are from 12 to 18 feet in length and borne on stout, stiff stalks. The leathery, sword-shaped leaflets, each from 2 to 3 feet long, are arranged flat, like a feather. Clustered round and twisted among the leaf bases is a quantity of substance like elastic matting. On one side it is smooth, the threads lying close together and on the other ridged by cross-woven threads.

Male and female flowers grow on the same plant, the male being smaller. Both appear clustered on many branched stems, sheathed in a "spathe" which spring from the axils of the outer leaves of the crown. They are yellowish and like stiff catkins.

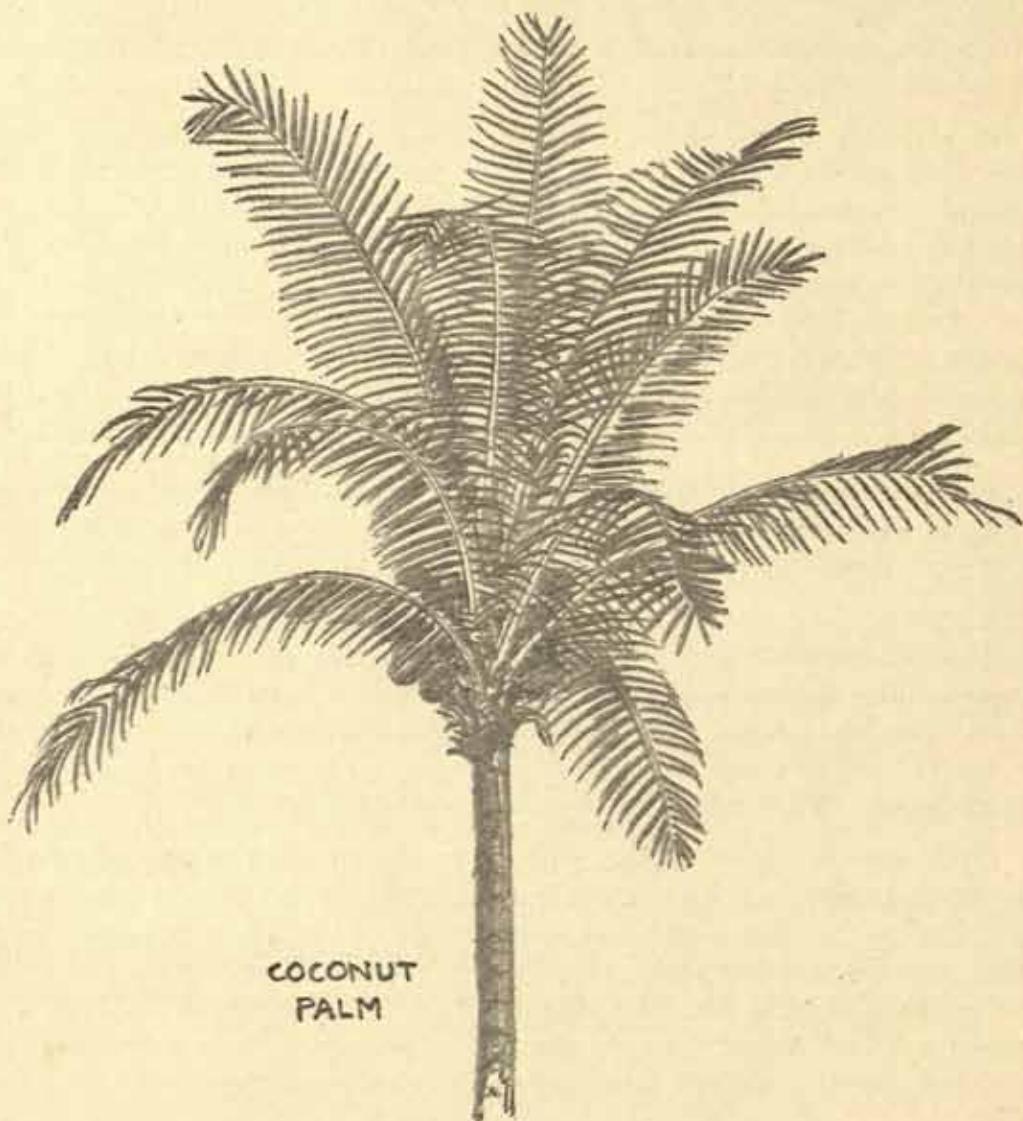
The well-known fruit is large and ovoid, the size of a man's head with a hard, green outer covering. Inside is a thick, brown fibre surrounding a hard shell with three basal pores. Within this is the albumen—the sweet and pleasant edible matter familiar to all—and the milk, which can be extracted by puncturing two of the pores. The embryo lies opposite one of the pores.

Little care is needed in the cultivation of this most useful plant. New fronds appear at the rate of one a month and in their third year of growth begin to fall. The plant is full-grown and at the height of its vigour between its 25th and 30th year when it has about twenty-eight fronds. There are usually about twelve branches of nuts, some bearing dry nuts, others ripe nuts. Most of the young fruits fall off when they are the size of golf balls, only a few achieving ripeness, but, even so, a single tree may produce up to one hundred nuts a year.

From the nut an oil is obtained. Freshly prepared, it is straw-coloured and practically inodorous, but later the oil becomes somewhat rancid both in smell and taste. It is made into shampoos and applied to the scalp to enrich the hair or encourage its growth after fevers. Refined, it is taken as a substitute for cod-liver oil. It is almost indispensable to the native for culinary purposes, in lamps and as a liniment, while large quantities are shipped abroad for use in the manufacture of soap and candles.

Commercial copra is obtained by cutting the nut open and drying the white "meat." This is used extensively in confectionery, *masala*, etc. and forms the "dried coconut" so popular in the West.

The Copra residue is the dried kernels after the oil has been expressed and is used as a fattening food for fowls and cattle, also as manure for young palms.



Coir is the thick, fibrous rind of the nut and has many uses. It is equally adequate as a stuffing for mattresses and saddles, for making carpets and mats and for the construction of strong ropes, durable in salt water. When the husk is cut across and the inner nut removed a hard brush is formed which is used for polishing and scrubbing.

No curry or *pillau* is complete without the albumen and the "milk." For cooling the palate when eating a "hot" curry nothing is more effective! Black paint is obtained by burning the shell; the downy substance at the bottom of the fronds makes a good styptic for wounds and the web-like substance growing where the flower branches expand, is employed in the making of bags and coverings, also for the straining of toddy. The leaves are used for thatching, the trunk for rafters, bridges and small boats. The wood is known as "porcupine wood" and has a pretty, mottled appearance. Dried and polished, the hard cases of the nuts make useful cups and vessels.

Perhaps the most interesting of all the varied products of this tree is toddy. Most visitors to the tropics have seen the toddy drawer—the *Sanar*—nimbly ascending the tall trunks seemingly in complete security. Actually, a considerable amount of practice is needed and it often takes as long as a year before a man is regarded as efficient. On reaching the top he selects a spathe which is ready for tapping; this must be about 2 feet long and 2 inches thick. He cuts the point transversely and fixes it in a curved position so that, when he has crushed the exposed flowers at the end, the juice may flow freely. This is repeated daily, a thin layer being shaved off on each occasion. In a week or two the tree is ready to yield toddy—as the *Sanar* knows by his observation of the crowding insects, the visiting birds and the dropping of the juice. The cut end of the spathe is then fixed to a vessel so that the drops fall into it, from which time it is no longer necessary to hammer and crush the flowers. A tree yields toddy for six months in the year and one man may have to attend to thirty or forty trees, ascending each, morning and evening.

From this toddy, sugar or jaggery can be obtained by slow boiling, a gallon yielding about 1 lb. After fermenting it becomes arrack, one of the intoxicating drinks of the country. Jaggery mixed with lime, or chunam, forms a strong, heat-resisting cement and takes a good polish.

Native doctors recommend toddy in cases of consumption and it is generally agreed that a drink each morning is beneficial to the health. Prisoners of the war in the Far East during the last war, suffering from deficiency of vitamins, were cured with toddy, which contains Vitamin B.

The name *Cocos* is from a Portuguese word meaning "monkey" and alludes to the appearance of the nut without its outer covering of coir, which was said to be like a monkey's head. *Nucifera* means "bearing nuts."

PALMYRA PALM

BORASSUS FLABELLIFER

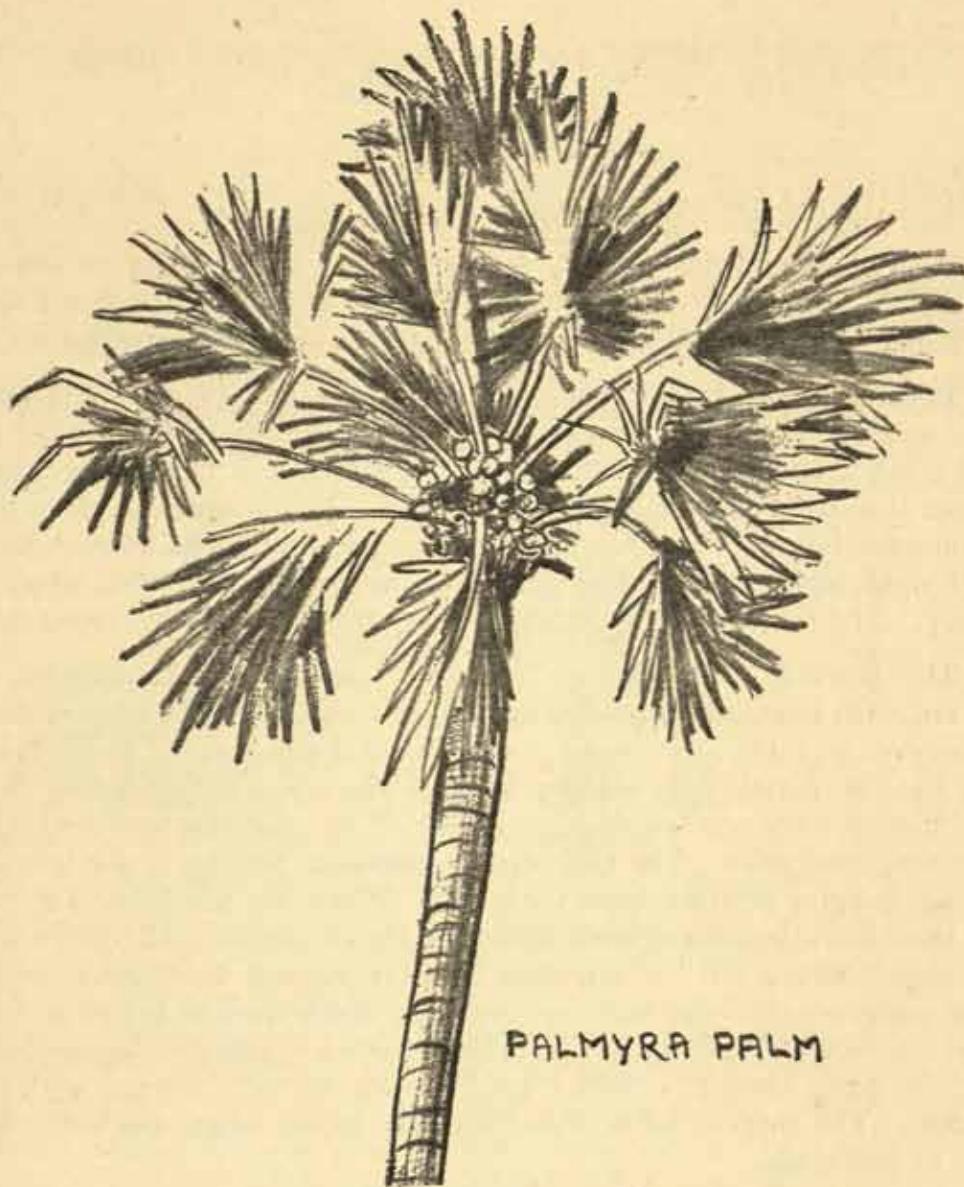
Tal, Talgachh (Hind.) ; *Tadi* (Mar.) ; *Pannei* (Tam.) ;
Bultar, Male ; *Phultar*, Female (Vern.) *Tadimar*

THE Palmyra is a tall, erect palm, easy to recognise by its large, fan-shaped leaves, which are quite unlike the pinnate leaves of other palms mentioned in this book. Its usual height is from 40 to 60 feet but 100 feet, with a diameter of 2 feet, is sometimes reached. The black, cylindrical stem is ridged by the semicircular scars of fallen leaves and in young trees, at the top by the dry bases of the leaf stalks which remain woven in a "plaited" manner. Old trees show a slight thickening above the middle and the base is always swollen by a dense network of root fibres.

The huge leaves, which spring in a clump from the summit, are borne on extremely tough, thick stalks, which leave that segment of the stem which they enfold like green gutters, protectively spiked at the edges. The leaves are palmate and as much as 10 feet across. The crowded segments, sixty to eighty in number, are connected for a part of their length, then spread out like stiff, shining lances, folded along the mid-ribs.

Male and female flowers are borne by different trees. Both are enclosed in long, branched sheaths. The male flowers, which are the smaller of the two, lie in closely overlapping bracts which appear to be sunk in the cavities of the branch. The female flower sheath bears only a few scattered flowers. During March and April and again later in the year flowers may be seen. These are followed by the green globular fruits which grow in drooping clusters at the base of the leaves, each fruit containing three nuts within the soft, fleshy pulp.

The Palmyra is one of the most valuable and important of Indian trees. It is not indigenous to this country but is now extensively cultivated and because it readily propagates itself in regions where it is abundant, it is also found growing wild. The uses to which various parts of the tree are put are innumerable. The hard outer wood is universally employed for posts, rafters and domestic purposes, but it is of no great strength and iron nails rust rapidly in it. The hollowed-out stem makes an ideal water-pipe, or, split in half, an open channel. Fans, mats, baskets, buckets, hats, umbrellas and sandals are made from the leaves, which also provide good thatch. The jelly-like pulp of the fruit and the soft kernels of young fruit are pleasant to eat, while the germinated nuts, with their enlarged, fleshy embryos are cooked and eaten as vegetables. The mid-ribs of the leaves and the fibres from their stalks are used in brush-making and the web-like substance at the base of young leaf stalks is used for straining the toddy and for making into torches. The chief product of the Palmyra, however, is Arrack or Toddy, the intoxicating drink of the country. Before fermentation it is a saccharine juice which, when freshly-drawn before sunrise, makes a tasty and health giving drink and, taken in large morning doses, has a laxative effect. The method of obtaining this sweet sap is as follows—the flowering branches,



PALMYRA PALM

both male or female, are first beaten and crushed, then a thin slice is cut from each spathe. After several days, when more thin slices have been cut, the spathe begins to exude a thick liquid. This is caught by earthenware pots or bamboos previously fixed in position. The collected sap, if not immediately drunk, is made into a sugar called "jaggery," or is distilled or fermented into Toddy. Both male and female trees will give a spring and winter crop but only the female continues to yield its sap throughout the monsoon. Thus the amount given by a female tree is about $1\frac{1}{2}$ times that of a male.

Fresh Toddy, mixed with rice flour and gently heated until it ferments, makes a valuable stimulant poultice. So it will be realised that like the Coconut and Bamboo, the Palmyra is of inestimable value to the people of India.

Borassus is from the Greek word describing the leathery covering of the fruit. *Flabellifer* means "fan-bearer."

FISH-TAIL PALM, TODDY PALM or KITUL PALM

CARYOTA URENS

Mari (Hind.) ; *Thippali* (Tam.) ; *Mhar, Jiluga* (Tel.) ; *Birli* (Mar.)

THIS fine palm, sometimes known as the Sago Palm is extremely handsome and differs in many ways from the other palms mentioned in this book, being remarkable for its much divided leaves and triangular leaflets.

It is widespread over India, Bengal and Ceylon, is much planted in gardens and makes an attractive pot plant when young. It is not a tall palm, 50 feet being about the highest it ever reaches and 20 feet being more common. The stem is smooth, grey and cylindrical. From the top issues a tuft of leaves, few in number but huge in size. They are bipinnate, the pinnae leaving the main stalk at right-angles and dividing into numerous, triangular leaflets which grow obliquely. The terminal leaflet is lobed, giving the outer edge a ragged look.

The flowers, emulating the leaves in oddity, are in addition quite attractive. On long, stout, pendulous branches, covered by large, grey sheaths, they develop in threes, the upper one, a male, opening first. It is reddish in colour, the two female ones being greenish. The tree's oddity lies in the fact that it flowers only once during the course of its existence and continues in flower for several years. The first branch appears at the top of the tree and is very long, hanging straight down the trunk. When this has finished flowering, others issue from the axils of lower leaves, or former leaves, until there is a thick level-ended "horse's tail" of branches. This downward development of flower sheaths continues until the very last one—the death-knell of the plant—shows itself at the foot of the trunk. The reddish berries which, developing from the flower, also hang down in a thick "tail" are the size of a nutmeg with a thin, acrid skin. The pulp is bitter and stings the hands when touched. Within are one or two seeds.

The wood is much stronger and more durable than that of other palms and is employed for many domestic purposes.

Toddy is obtained by tapping when the tree is between 15 to 20 years old and commences to flower. The annual yield is about 180 gallons. Mahomedans use the seeds as beads. From the interior of the stem is obtained a sago-like starch which is made into bread or boiled into gruel : but the most important product of the tree is *Kitul* fibre which is made from the sheaths of the leaf stalks. This is very strong and is made into ropes, brushes, baskets, fishing lines and other articles, many of which are shipped abroad.

The name *Urens* means "burning" and refers to the acrid quality of the fruit.



THE ROYAL PALM, MOUNTAIN GLORY *or* BOTTLE PALM

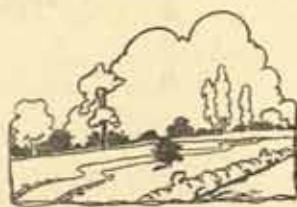
OREDOXA REGIA

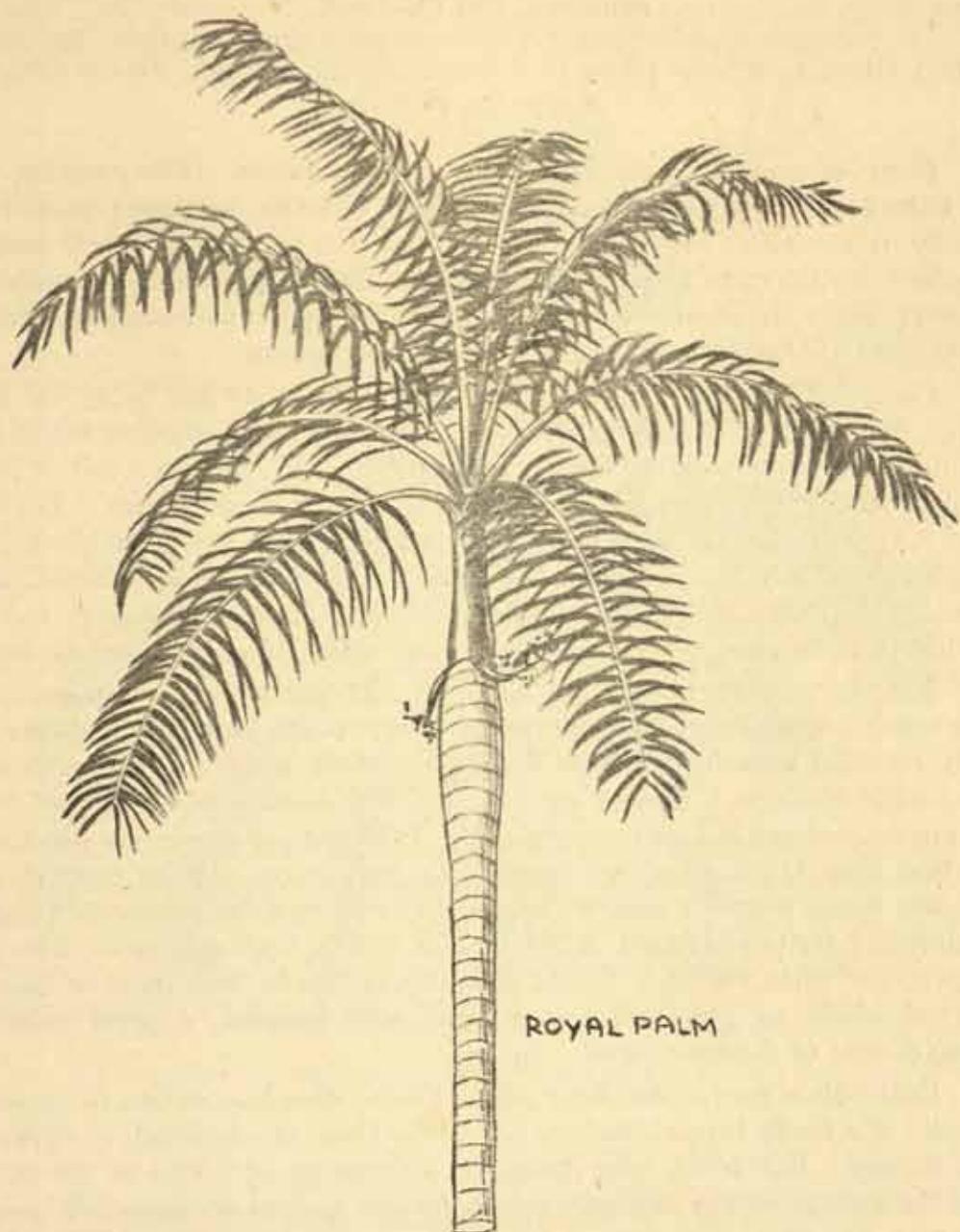
THIS elegant palm has only recently been imported into India from the West Indies where it is very common. It is now much planted in parks and gardens where it reaches a height of about 50 feet and is very decorative, particularly when planted in avenues. The erect, unbranched stem very often has a distinct thickening towards the top, but this is not invariable and cannot be described as a definite characteristic of the tree. The bark is of palest grey, smooth and evenly ringed ; sharply divided from this grey bole rises a polished, green cylinder, swollen at its base, and from the summit emerges a tuft of numerous, long, arched leaves. These are crowded with 30 inches narrow leaflets alternately inserted in contrary ways, which means that they lie in two planes. Towards the tip they are almost in one plane like a coconut leaf : new leaves are also like this. Many of the leaflets are curved or folded and the whole presents an attractively shaggy appearance.

The flower sprays spring from the top of the trunk, below the green cylinder and are enclosed in sheaths. Before opening, the spathes are erect, then they lie horizontal and the much branched sprays burst forth. Male and female flowers are on the same trees but the former are larger and open first. Both are straw yellow. The fruits are small and round and form in clusters.

This palm has not been grown long enough in India to have the extensive uses of our own palms, but the tender top portion is cooked and eaten as a vegetable.

The name *Oreodoxa* is from two Greek words meaning "mountain" and "glory" ; "*Regia*" means "regal."





WILD DATE PALM or TODDY PALM

PHÖENIX SYLVESTRIS

Khaji (Hind.) ; *Khajur* (Beng.) ; *Eetchum-pannay* (Tam.) ; *Shindi* (Mar.)
Pedda-eeta (Tel.)

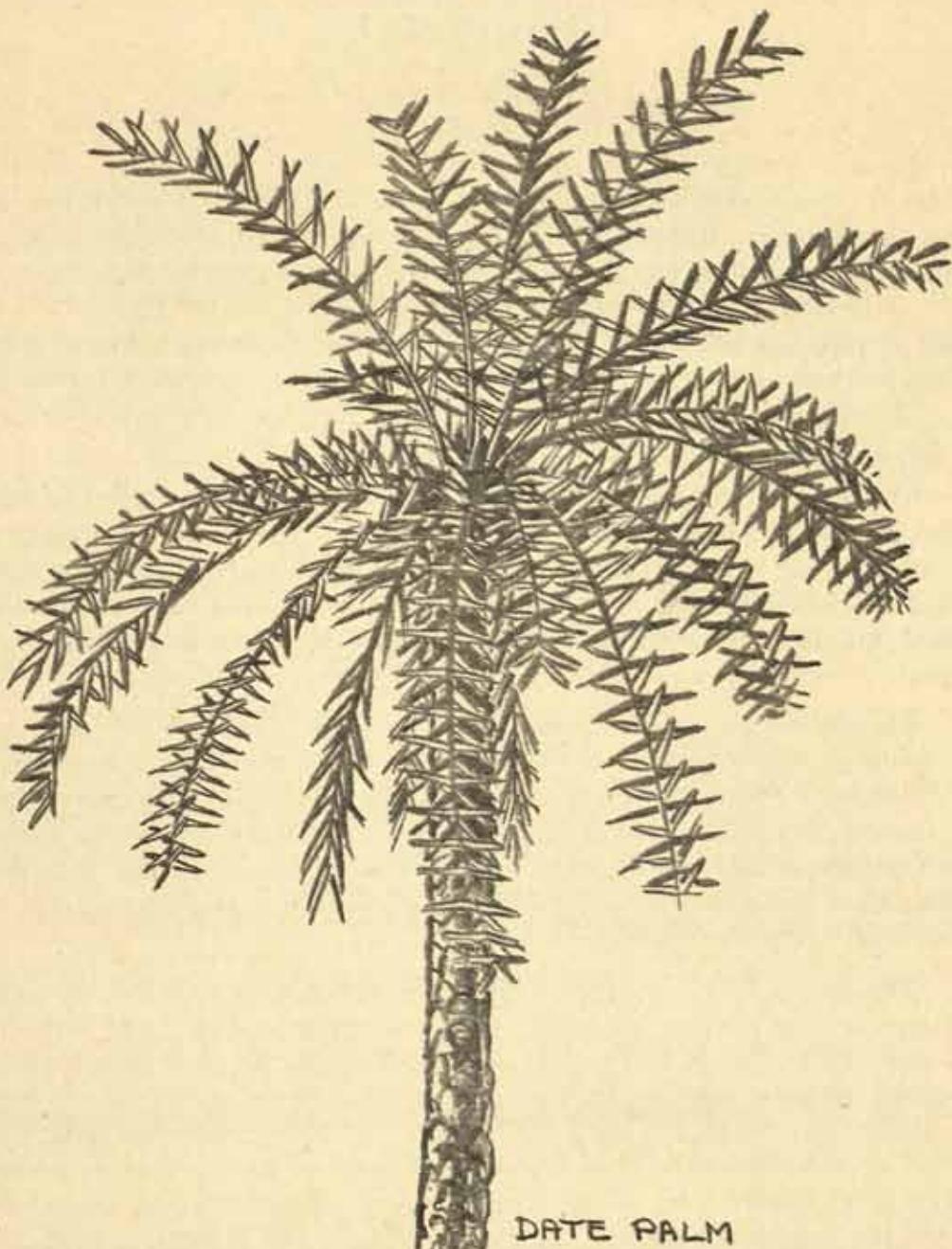
HERE is another of our extremely valuable palms. The common wild Date Palm is one of the most conspicuous trees in India, in some regions being the only tree visible. In some districts it forms gregarious forest growths and covers considerable areas. Many of these forests are Reserved and belong to Government ; the rights of toddy tapping are allowed to certain individuals and the toddy obtained yields them a considerable income.

Comparatively speaking, it is small palm—30 or 40 feet being the usual height. The thick stem is densely covered with the bases of fallen leaves and, lower down, by the remaining scars. From the summit emerges a tuft of leaves and more leaves issue from the sides, forming a thick, round crown. The long, arched leaves divide into numerous, rigid leaflets. These are sword-shaped and a greyish-green in colour. Unlike the leaves of the Coconut and Areca palms the leaflets on each side do not lie parallel ; they grow alternatively out and up—that is, in two planes—giving a criss-cross, spiky effect to the whole leaf.

Male and female flowers are borne by different trees, as in many other palms : they are sheathed in a long, stout spathe which bursts to disclose many thickly crowded branchlets. Male flowers are small, waxy and white, on short stalks, while the female flowers are greenish and develop in clusters of three. Both are scented and appear during March. The fruits, of course, are much more important than the flowers and much more conspicuous. They form on long pendulous stems nearly a yard in length, from which issue numerous bunches. The clustered fruits are round or oblong and at first hard and green, becoming orange-yellow when mature. Jellies and jams are made from them or they are preserved whole, or powdered into a paste with locusts. A good palm will develop dozens of clumps of fruit.

Date palms give an excellent yield of palm-wine but, as can be expected, the fruits of a freely tapped tree are inferior to those of one which is allowed to retain its sap. Extraction also spoils the appearance of a tree as the cutting makes the stem grow in a curiously zig-zag fashion and the terminal tuft becomes lop-sided. Tapping is done thus : after the rains the lowest side leaves are cut away for half the circumference ; this bare part is at first white but turns brown and appears like coarse matting. After a few days this surface is cut in a large V and a triangle is removed from the pith ; the sap runs out and is conducted down a channel, made from bamboo, or a Palmyra leaf rib, into a container. The wound is renewed twice at intervals by paring a thin slice from the notch and then the tree is allowed to rest. The flow from the first cutting is the biggest and best. It is either drunk fresh or boiled down to a brown viscid matter and sold to sugar refineries, or distilled into a potent spirit known on the Coromandel coast as *Paria-arak*. Sap is extracted when the plant is seven to ten years old and only about 4 feet high. November to February is the tapping period and an

average yield will be about 180 pints; this if boiled down to sugar produces 7 or 8 lbs. It is generally considered to be inferior to cane-sugar.



DATE PALM

Other parts of the tree have their uses. Sleeping mats are woven from the leaves and baskets from the leaf stalks; these are also twisted into ropes used, among other things, for drawing water from wells. In some places the fruit is chewed with betel-leaf and chunam like areca.

There are eight species of wild date palm in India in addition to the cultivated date (*P. dactylifera*) which is considered to be the parent stock of all cultivated varieties.

ARECA or BETEL-NUT PALM

ARECA CATECHU

Gua (Beng.); *Supari* (Hind.); *Paku* (Tam.)

PROBABLY originating in Malaya the Betel-Nut Palm is now cultivated over all the hot, damp coastal regions of Asia and has a wide distribution in India. In Malabar, Kanara and round the hills of South India, in Ceylon, Burma and Assam it is very common, its elegant and graceful beauty an asset to any district where it flourishes. Rising to 60 or even 100 feet with a girth of only 18 inches it bears at the summit of its slender, unbranched stem a crown of long feathery leaves surrounding lovely, drooping clusters of shining red fruit. These palms are often seen in clumps of a couple of dozen plants, together with the few small leaves of numerous new growths.

The flowers, which appear early in the year are at first enclosed in smooth, double sheaths the bases of which partially enfold the trunk. Bursting from their sheaths the much branched sprays reveal both male and female flowers, the latter being solitary at the axils and bases of the branches and the former in great number above them. The appearance is of numerous stiff, creamy catkins.

The slender grey stem is ridged with the scars of fallen leaves and topped by a polished area of green or orange, from which rises the tuft of graceful, arched leaves. These bear on each side a large number of dark-green leaflets, long, narrow and pointed and lying in one plane like coconut leaflets. But they differ from those by being less rigid and are often seen with the tips bending downwards. The centre rib is so strong that, when dry and expanded it forms an excellent ready-made splint.

The name Betel is applied to two different plants which are closely associated in the purpose to which they are applied. Betel leaf is from the betel-vine (*Piper Betel*), known as *pan* and allied to the plant which produces our table pepper; betel-nut is the fruit of the Areca palm so universally chewed by the people of Asia. This innocent but somewhat unattractive habit of chewing is indulged in by many millions of people who are estimated to chew over 50,000 tons of palm seeds yearly. Mastication is considered to sweeten the breath, strengthen the gums and tone the digestion; it also has a mildly narcotic effect and produces a copious flow of brick-red saliva which stains the teeth and gums. Methods of preparing the cud vary, but the common way is to take a *pan* and smear it with quicklime and *cutch* and to place thereon slices of betel-nut. Sometimes flavourings such as clove, tamarind or tobacco are added, the whole is then wrapped up and placed in the mouth. This gum known as *cutch* is an extract from the red heart-wood of the *Acacia Catechu* tree and is extremely astringent. Another form, known as



BETEL-NUT PALM

kath is a pale, biscuit-like substance obtained from white heart-wood of the same tree. It is carefully prepared and fetches comparatively high prices.

The betel-nuts, each the size of a hen's egg, hang in generous clusters from below the bases of the leaves. Within a smooth, orange or scarlet outer covering lies a fibrous ring which encases the seed. A tree begins to bear fruit after its 5th year and a good specimen will produce annually as many as three hundred nuts and continue to do so for about 25 years.

As well as being widely employed for chewing, there are other uses for these prolific nuts. Burnt to charcoal and powdered they make a good dentifrice, and a preparation made from them in powder form checks dysentery arising from debility. They are used in turning for necklaces, the knobs of walking-sticks and other small articles.

The wood makes bows and spear handles and the trunk forms a good scaffolding pole. The sheaths enfolding the young leaves are used as wrapping like brown paper, also as writing-paper, and as the covering of Burma cheroots.



SHRUBS
AND
CREEPERS

GOLDEN DEWDROP or SKY FLOWER

DURANTA PLUMERI

THIS charming little evergreen shrub is a native of the West Indies, but is now popular in India as a garden plant, particularly as a hedge. Unpruned, it spreads and rises to 8 feet or more in height, with stiff brown branches and long, gracefully arched flower sprays. When trimmed it grows strongly and compactly but should not be regularly clipped, as are some hedges, because the charm of the plant would be lost if its lovely, cool flowers were not allowed to make their appearance. The clustered masses of tiny, mauve flowers stand out conspicuously from the close darkness of the leave. Every cluster bear numerous, trumpet-shaped flowers—each less than $\frac{1}{2}$ inch across. These consist of a close, green calyx, a short, yellow-centred tube and two lips, the upper one divided into three curved lobes and the lower into two, each of the latter having a central purple streak. The principal flowering period is January and February, but a few flowers may usually be seen on one plant or another throughout the dry season. Soon after flowering the fruits appear. These are most unexpected and it is difficult to believe they belong to the same plant, although flowers and fruit are always seen side by side. The fruits appear in as great profusion as the flowers and each spray droops with the weight of the round, orange berries; these are glossy and soft, contrasting vividly with the delicate flowers and deep foliage.

The leaves are small, pointed ovals, dark-green as in most evergreens and grow closely along every branch and branchlet. They vary in size, sometimes have serrate edges and are often twisted or curled. The under side is paler and slightly downy.

This plant is not widely used medicinally or economically but the berries steeped in liquid are claimed to be lethal to gnats and mosquitoes.

There is a variety, *D. ellisii*, which has white flowers and another variety with thorns and white centred, mauve flowers.



DR. OWEN

INS:

GOLDEN DEWDROP



INS: 1

B. N. COWEN

OLEANDER

OLEANDER

NERIUM ODORUM or *NERIUM INDICA*

Kaner (Hind.) ; *Aralee* (Tam.) ; *Lal-kharubee, Pudma-kurubee* (Beng.)

THE original home of this handsome shrub is in the Mediterranean region where it is sometimes called Rose Laurel and is thought to be the " willow of the brook " of Scriptures. Now it is common in many parts of India, growing wild in rocky stream-beds in the Lower Himalayas, fringing roads and rivers and adorning hundreds of gardens. It is a strong shrub, not as a rule more than 10 feet high, with upright branches and evergreen foliage. Its several varieties have all become very popular as cultivated shrubs because of their fragrant, showy blooms and in spite of the poisonous quality of the sap. They flower throughout the year, but are at their best during the rains. Deep rose, pink, and white flowers are all common in both their single and double forms. They grow in large sprays and in the double varieties the flowers are massed so closely as to be indistinguishable as individuals. Each bloom rises on a short stalk, lies in a small, five-cleft calyx, is salver-shaped and about 2 inches across. The single variety has five broad petals opening from a short tube to the inside of which bands of stamens adhere and divide into several ragged segments. The fruit is a narrow 8-inch cylinder and contains brown, silky seeds.

The leaves are very distinctive and although somewhat similar to the leaves of the Yellow Oleander (*Thevetia neriifolia*) could not be mistaken for any others once they have been studied. They are unusually narrow and tapering and grow in whorls of three on very short stalks. A little over an inch in width their length may be 8 or 9 inches. In colour they are a dark, dusty green above and paler below. The veining on the underside barely shows on the upper surface.

All parts of the plant are dangerously poisonous and in common with other plants which have this characteristic, exude a milky sap from cut stems and young shoots. The shrub is always left untouched by cattle, goats and other domestic animals who appear to be aware of the fatal results a meal of Oleander leaves would have.

This poison, however, is put to use by medical men ; a paste made from the bark of the roots is a remedy for ringworm while leprosy and boils are treated with preparations containing the poison. The leaves, boiled in oil, are also claimed to be efficacious in the curing of skin diseases. Women in India driven to suicide by jealousy, misery or sickness have been known to eat Oleander roots.

The flowers are among those chosen by Hindus to offer to the God Siva.

Hookah tubes are sometimes made from the stalks.

A rare, yellow variety is known.

PEACOCK FLOWER or BARBADOES PRIDE

CÆSALPINIA PULCHERRIMA or *POINCIANA PULCHERRIMA*

Komri (Tam.) ; *Kurish Churin* (Hindi) ; *Gool-i-Toorah* (Vern.) ;
Krishna Choora (Red) and *Radha Choora* (Yellow) (Beng.)

VILLAGE people, if asked for information about the red flowering variety of this shrub, will often tell you that it is a *Gul Mohr* ; others, granting that there is a difference in size if nothing else, will call it the *Gul Mohr* bush ; and indeed there is considerable similarity between both leaves and flowers, but a brief observation will reveal that the form and growth of the shrub is quite unlike the tree and the flowers, as well as being smaller, are grouped differently.

Its native country is unknown but for many years now it has been cultivated all over India and the tropics. The pure yellow and bright orange-red types are equally popular and few gardens of any size are without one or two. Villagers too, like their bright, exciting colours. It is the showiest of the forty odd species of *Cæsalpinia*.

Rising to about 10 feet and branching low to form an open, spreading bush, it has clear green, feathery foliage topped practically throughout the year with broad spires of blossoms. The bark is pale and smooth, often marked with blackish spots and armed with stout prickles rising from round protuberances. Young branches are smooth and green. The big, long-stemmed bi-pinnate leaves grow opposite at wide intervals. Each of the twelve to eighteen pinnæ bears from twenty to forty small, oblong leaflets with very slightly lobed ends. They are smooth and dull, the underside being considerably paler.

The large sprays of flowers appear at the ends of the branches and are often sub-divided into smaller sprays. Egg-shaped buds and open flowers are all borne on long, slim stems. In the red variety, the flowers are first vermillion edged and streaked with deep-yellow. Later they become entirely red.

Of the five spoon-shaped petals, one is smaller and shaped differently, but all have crinkly edges. The red and orange calyx has five, long lobes which are spread to show between the petals. Ten very long, red stamens, rising from each flower give the sprays a whiskery appearance : in opening these flowers are curiously curled and twisted.

The pods are straight, narrow and thin and about 3 inches long.

Legends connect the Peacock Flower with the God Shiva so, to all Hindus, it is sacred. All parts have medicinal uses and to women in particular are administered concoctions from which they derive benefit. Taken as a substitute for senna the leaves are an efficient purgative ; as a fomentation they are claimed to heal wounds. The roots are considered by some to be poisonous, but, like many poisons, a tonic if taken in suitably small quantities.

Ink is made from the charred wood.



INS:

D. J. OWEN

PEACOCK FLOWER



INS.

EDWEN

PAPER-CHASE TREE

PAPER-CHASE TREE or DHOBY TREE

MUSSÆNDA FRONDOSA

Bhutkesh (Mar.) ; *Bebana* (Bombay) ; *Sarvad, Lanchut* (Vern.)

THERE are several kinds of *Mussænda*, all easily recognised by the curious enlargement of some of the flower sepals. This growth is usually white, sometimes light yellow and at first glance looks as if it might be the pale underside of a leaf, or, as the name suggests, one might get the impression that someone had been scattering paper among the leaves.

It is an erect shrub or small tree with a tendency to climb and is very common all over India. The bark is grey and smooth but the branches are covered with a coarse, brown down. The oval, pointed leaves are usually smooth above but downy underneath. They are a fairly deep green in colour. Stems and veins are red and so indented are the leaves by these veins that they have a quilted appearance.

The bush blooms from July to October, bearing on stout, hairy stalks, clusters of small, orange flowers. From the calyx of narrow sepals protrudes the long, green corolla tube. This swells at the end and opens into five triangular petals, like orange velvet. Beneath, these are pale green and the centre of the flower is yellow. On a few of the flowers one sepal of the calyx is prolonged into an oval bract, dead white in colour and very distinctive. In Bombay these white leaves are eaten as a vegetable and, as can be expected with a shrub as common as this, various parts of it have medicinal uses. The root is bitter and has an alterative and demulcent action. It is used in the treatment of white leprosy and eye trouble. A weak decoction of dried shoots is often given to children as a cure for coughs. The wood is used for turning, and in the villages ladles, spoons and other domestic articles are made from it as they are said to avert the evil eye. For the same reason milch cattle are tied to pegs made from this wood.

M. erythrophylla is a variety found in the hills with crimson bracts and yellow flowers.

M. luteola is a smaller shrub, attaining only 4 feet in height. The flowers are yellow and the bracts the same colour but of a much paler shade.

M. corymbosa has pale orange flowers and white bracts.

M. frondosa means "the leafy *Mussænda*."

BOUGAINVILLEA

BOUGAINVILLEAS form one of the most conspicuous and colourful features of Eastern gardens. They make admirable boundary hedges and fences ; pruned to suitable dimensions they make perfect pot plants ; over an arch or pergola they are a beautiful sight while left to ramble through a straggling tree they give their host the appearance of being in constant bloom. The colours vary from magenta and purple to crimson, brick-red and pale-pink. The tones of the magenta varieties being rather strident they are apt to clash with other flowers and are at their best against a background of green, or even better against a clear blue sky.

In their homes in South America the various species are found as climbing shrubs and many are of the opinion that they will always look their best thus, rambling unchecked in the wilder corners of the garden. The first specimens were collected in Brazil by L. A. de Bougainville on his voyage round the world towards the end of the 18th Century and it is in his honour that the genus has been named.

What appear to be the flowers are really trios of brightly coloured bracts which surround the true flowers. These flowers, usually in threes, are small and tubular, each partly adhering to the base of a bract. The long, ridged calyx tube is greenish or cream-coloured, often tinged with the colour of the bracts, and opens at the end into a tiny, frilled flower, either white or yellow.

The stems are armed with spines which assist the plant in its climbing and rambling and the leaves are simple and alternate.

There are innumerable varieties of Bougainvillea and a host of hybrids all of which it would be impossible to describe. On several occasions a variety has been introduced into gardens in different parts of India under different names. From each of these hybrids have been produced and the result has been considerable confusion, resulting in many valid varieties having three or four names.

All the known varieties are derived from four species ; *B. spectabilis*, *B. glabra*, *B. peruviana* and *B. buttiana*.

B. spectabilis has purple or rose-purple bracts each about $1\frac{1}{2}$ inches long. The flower heads are grouped at the ends or sprout from the sides of the branches, each borne on a short stalk. The leaves grow alternately. They have a short stem, are oval in shape, sometimes with a slightly pointed tip and are somewhat hirsute. Varieties of this species include *var. laterita* which has brick-red bracts, fading to Brazil red and *var. Rosa Catalina*, the familiar Pink Bougainvillea, which has bracts of a pale-red or bright rose.

B. glabra has magenta bracts but the leaves are smooth, oblong and bright green. The whole plant is less hairy than *B. spectabilis* and is more



BOUGAINVILLEA GLABRA (top) AND MRS. BUTT



CAMPHIRE

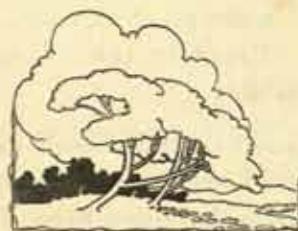


LANTANA

popular than that species as it flowers almost continuously throughout the year. There are two varieties of this species differing only slightly in the shade of the bracts and in the size of the flower panicles.

B. peruviana has smaller, mauve-pink bracts, yellowish flowers and large, smooth leaves. The two varieties, *var. Lady Hudson* and *var. Princess Margaret Rose* are very similar and a deep shade of pink.

B. buttiania has cerise bracts turning to crimson-purple and dark-green, broad, rather hairy leaves. It is a beautiful plant with its close branches of flowers and deservedly popular. Concerning its origin there has been some confusion but Mr. Holttum of Malaya has clarified matters considerably by collecting much useful data on the subject. Mrs. Butt of Trinidad is recorded as having taken cuttings from Cartagena at the beginning of this century and propagating the species in Trinidad. A few years later a similar plant was introduced into Florida from British Guiana. When it appeared in Europe it was known both as Mrs. Butt and Crimson Lake. Still later a Bougainvillea with only a slight difference in the flowers came to India from the West Indies. This was named Scarlet Queen. Varieties of these Bougainvilleas appeared in different parts of the world with orange instead of crimson bracts. These were named Louis Wathen and Mrs. McLean and although these two have a slight difference it seems obvious that they have a common origin. With age they fade to a pretty salmon pink.



LANTANA

LANTANA ACULEATA

Chaneri, Tantani (Mar.)

ONE of the commonest and most troublesome weeds in India, the Lantana, in its cultivated forms, is a charming garden plant. *Lantana aculeata* is occasionally considered to be useful in giving shelter to young sandalwood trees but because of its vigorous growth and the amazing speed at which it can spread, it has become a serious menace and costs the country many rupees in damage. Along the river banks of Bengal it is especially prolific.

It is a rambling, prickly shrub, a native of tropical America, said to have been brought to India from Australia by a planter. It has a strong smell of blackcurrants, which is more apparent when the plant is touched or disturbed. The square branches are pale green and either hairy or armed with recurved prickles. The leaves, too, are hirsute but in this case the hairs are invisible. An attempt to stroke one "against the pile" however, will immediately reveal the strength and density of the tiny prickles. Of a bright clear green, the leaves grow in pairs, each pair roughly crosswise to the next. They reach about 3 inches in length, are oval in shape with pointed tips. They have a round-toothed edge and are often wavy; underneath the many veins are predominant and, above, these give a wrinkled effect.

The flowers, which may be found throughout the year, grow on slim stalks from the axils of the leaves and are therefore also in pairs. Twenty or thirty tiny, unevenly-petalled flowers with long tubes form a compact head about 1 inch across and many have the charm of being multi-coloured. In *Lantana aculeata*, the commonest variety, the inner blooms are deep crimson and the outer circles are bright orange, all with orange centres. Another common one has an outer ring of orange-centred, pink flowers, surrounding a group of pale yellow ones with dark yellow centres. Cut short and massed in a small trough vase, these flowers make an attractive table decoration and may be obtained when no other flowers are available.

The fruit is a berry, green or blue-black and is very popular with birds who spread the seeds widely and are largely responsible for the weed becoming such a menace. Nearly fifty varieties have been developed; all retain the blackcurrant smell and the hairy leaf formation but the flower heads are in many lovely shades of mauves, pinks, yellows and oranges.

L. cloth of gold is all a brilliant yellow. *L. chelsonii* is orange red in the centre, paling to orange at the edges. *L. camara* is pink outside and the yellow centred flowerlets are lined with orange. *L. delicatissima* has a pale yellow heart marked with deeper yellow and surrounded by a circle of palest pink. *L. coccinea* is orange-crimson and *L. alba* is white.

CAMPHIRE, HENNAH or EGYPTIAN PRIVET

LAWSONIA INERMIS

Mehndi (Hind.) ; *Marudani* (Tam.) ; *Khenna* (Egypt) ; *Al Khanna* (Arabic) ;
Jamaica Mignonette (W. Indies)

THIS very common Indian shrub, known in so many parts of the world, has a history which dates back to thousands of years B.C. In the Song of Solomon we read " My beloved is unto me as a cluster of camphire in the vineyards of Engedi." Mrs. Temple in her *Flowers & Gardens* tells us " This camphire or hennah, is Pliny's ' Cypress of Egypt,' " and the women of Egypt and other Eastern countries stain not only the palms of their hands and the soles of their feet with a paste of hennah leaves but also the tips of their fingers, the nails and knuckles, from which custom probably arises the designation of Aurora as " rosy " or " rosy fingered." Mummies have been found with hennahed nails and up to the present time Egyptian women consider it almost indecent to be seen without their nails dyed. The powdered leaves are beaten up with catechu paste and the dye will endure for three or four weeks. It is a popular form of embellishment among Indian women and many men from the North like to give their hair and beards a copper tint and even gharry horses, particularly grey ones, are adorned with flamboyant, red manes and tails ; or worse—large spots like a rocking horse. Skins and leather too, can be dyed with hennah but as the plant contains no tannin the colour is impermanent.

When young the Camphire is a smooth, twiggy bush with straight branches and numerous branchlets. With age, and it grows very quickly, it acquires a multitude of prickles and thorns which are often concealed in small, easy side shoots. Well cut back and constantly pruned it makes an ideal hedge, being an almost impenetrable barrier.

The long spires of pale gold flowers have a heavy, clinging fragrance and are well suited for cutting. They bloom throughout the year, the tiny, glossy buds opening into tiny stars. Numerous protruding, yellow-tipped stamens give the sprays a soft, fluffy effect. The fruit is a small, brown pea containing many seeds. The numberless, 1 inch leaves grow on short stalks from the red-brown branches, the branchlets and every little side twig.

From the flowers, leaves and young shoots an extract is obtained which is used in the treatment of leprosy and from the flowers perfumes are concocted.

IXORA

Rangan, Rookmini (Vern.)

THERE are so many species and varieties of Ixora that it is sometimes difficult, with so many colours and sizes, to realise that the different varieties belong to the same genus. They grow as shrubs or small trees with rough, grey branches and glossy, dark red stems.

The smooth leaves, which appear in pairs—occasionally in threes—are dark and shining, paler underneath with definite veins. New leaves are a clear, translucent lime green.

Each flower is a long, slender tube dividing into four spreading petals from the bases of which spring four stamens. The flowers are massed in heads of various sizes, sometimes immense, round, full trusses, other times merely a group of a dozen or so. All shades and colours are found except blues and purples. As the flowers remain fresh for a long time after plucking they are well suited for indoor decoration.

A native of tropical Asia and Africa the Ixora is now common in all Eastern countries, both in its wild state and as a cultivated garden shrub. It flowers throughout the year but is at its best during the rains.

The country people find many medicinal uses for the various parts of the plant. The roots are made into a medicine to alleviate stomach troubles and cure dysentery, although it is admitted that it is not so effective as Ipecacuanha.

Perhaps the commonest is *Ixora coccinea* known as the Scarlet Ixora or Flame Tree of the Woods, *Bakora* in Marathi, *Vedchi* in Tamil and as *Rangam* in Bengal. The word *coccinea* means "scarlet." This is one of the smaller varieties and reaches no more than 5 feet in height. The brilliant flowers grow in large, compact heads which are particularly attractive during the monsoon. It is frequently found growing wild in scrubby undergrowth, but in such circumstances the flower heads are much smaller. The fruit is black and about the size of a cherry and supposed to be favoured by peacocks. A decoction from the flowers or bark is claimed to relieve bloodshot eyes and to cure sores and ulcers. The bush is held sacred to Siva and Vishnu and the flowers are offered to the God Ixora.

I. rosea, meaning the Pink Ixora, is an untidy, straggling bush, rarely reaching 4 feet but it bears large, round heads of flowers which contrast attractively with the dark-green leaves. The pink is inclined to darken as the flower ages.

I. parviflora means "the Small-flowered Ixora" and it is known as the Torch Tree in English, *Kota Gandhal* in Hindi and *Kurat* in the Bombay district. It is a small tree with many branches and fragrant whitish flowers but is not



CORAL HIBISCUS



SCARLET IXORA

particularly attractive. In Madras it is very common and branches from it are used as torches by letter carriers.

I. barbata is called the Bearded Ixora because of the woolly appearance of the mouth of the flower. It is a large shrub with many branches starting almost from the ground. The flower stalks are dull purple and the long-tubed white flowers bear spreading, yellow-anthered stamens.

I. griffithii is considered by many to be the best of the Ixoras. It grows to about 4 to 5 feet and bears huge orange trusses, sometimes as much as 9 inches across. A young bush only 2 feet high may produce as many as twenty flower heads. It is frequently grown in tubs.

I. chinensis is orange flowered. *I. undulata* has white flowers, *I. fulgens*, scarlet, *I. lutea* yellow and *I. Singaporense* orange.



HIBISCUS

Gurhul Jaswand, Jaba, Juva (Vern.)

THIS fine flowering shrub is a useful ornament to any garden. There are numerous species and varieties and crosses, some salver, some trumpet-shaped, some single and some double, the latter being like huge, full blown roses. Flowers appear all through the year and are very popular with sunbirds and tailor-birds who insert their beaks between the petals at the back of the flower to reach the nectar. With few exceptions all varieties are scentless. The plant belongs to the mallow family and was once thought to be allied to the hollyhock because of the similarity in arrangement of the flowers.

The four main types are *H. mutabilis*, *H. rosa sinensis*, *H. syriacus* and *H. schizopetalus*. The first is known as the Changeable Rose, *Mutabilis* meaning changeable, or Persian Rose and in parts of America as the Cotton Rose or Confederate Rose. The vernacular names are *Gool-i-ujaib* and *Oru*. It is, of course, not a rose at all but the names have no doubt been given because of the appearance of the double varieties. It blooms in September and October and is a large shrub, inclined to be straggly and with distinctive leaves. These are large and heart-shaped, almost as broad as they are long and with five veins radiating to the point of each, rather indefinite, lobe. The edge is serrate and the whole leaf and stem is covered with a fine down. The large flowers, single or double and 3-4 inches across, are pure white in the morning and gradually turn through pale pink to deep rose in the evening. By night they are dead, but both life and colour can be retained for some hours by plucking them during the morning and keeping them in a refrigerator. The fruit is a small, hairy capsule. All other Hibiscus flowers, except the scarlet ones, lose their red colouring matter during the day.

H. rosa sinensis, called the Shoe Plant or China Rose as it was introduced from that country, is known in India as *Jasud* or *Juwa*. It is perhaps the commonest and most beautiful of them all, its large, single bell-shaped flowers being a lovely shade of rich Chinese red. There are now double varieties and many new colours, including white, yellow, pink, orange, terra-cotta, cerise, have been introduced. The leaves are bright green ovals, pointed at the apex and coarsely toothed except round the base. They grow alternately on a short stalk, at the bottom of which is a narrow bract. Amongst the leaves, the lovely flowers with their long bunches of stamens hang like open bells. The calyx is rather unusual. Circling the five sepals is what appears to be a secondary calyx comprised of several narrow pointed leaves.

Exhilarating reds and scarlets are always popular in the East and the China Rose is no exception. It is used on festive occasions, as a hair decoration and often, too, in sepulchral rites. The blossoms last only one day, but like the changeable Rose, their life can be prolonged by keeping them in the refrigerator.

At some time it was discovered that a crushed flower, rubbed on black shoes with the hand, gave a fine polish and now it is a common method of shoe-polishing.

H. syriacus was named by Linnaeus because he contended that the plant was a native of Syria. The lovely name Rose of Sharon was no doubt given for the same reason, but it is now considered more probable that it originally came from China. Shrubby Althea is another name by which it is known in some places. Thriving best in the hills it produces lovely white, blue or mauve flowers, either single or double. Like hollyhocks they spring from the axils of the leaves.

H. schizopetalus, known as the Coral Hibiscus, was imported from Africa. From April to September it bears red or orange-red flowers, drooping and fuschia-like, with deeply fringed petals. The staminal tube is exceptionally long, up to 6 inches in length and this feature is retained in flowers which have been crossed with other varieties.

H. micranthus is a strong, shrubby plant often seen in hedges in the hotter parts of India. The leaves are deeply serrate and the flowers solitary, small and pink. Like the other types there are many varieties and innumerable hybrids continue to be introduced.



YELLOW OLEANDER, EXILE TREE or LUCKY NUT

THEVETIA NERIIFOLIA or *THEVETIA PERUVIANA*

Zard Kunel, Pila Kaner (Hind.); *Kolkaphul* (Beng.)

THIS large, attractive shrub is easily recognised by its narrow, pointed leaves and scattered, yellow flowers. It is now very common throughout India and all tropical countries, thriving especially well in the drier regions. Every part of the bush is extremely poisonous, especially the milky sap which exudes from stems and shoots, when cut. Its popularity may be due in part to this fact, as goats and cattle will not graze from it, and it is allowed to grow in symmetrical formation, bearing leaves almost to the ground.

The waxy, yellow flowers are slightly fragrant but short lived. However, blossoms continue to appear throughout the year and although they never bloom in profusion it is but rarely one comes across a bush with not a single flower. They spring from the ends of the branchlets and from small side shoots and are bell-shaped with five overlapping petals.

The fruit is like a crab-apple in appearance. Inside is a woody stone containing two seeds. These are known as Lucky Seeds or Lucky Beans and are made into pendants or charms, or kept in the pocket "for luck."

Leaves are always present in great number, shining, green lances pointing in every direction. Underneath they are pale and dull.

The seeds give a bright yellow oil which burns well and is also used in medicine.

"Thevetin," a strong poison, is obtained from the bark and made into a powerful febrifuge, but should be employed with great caution. In the U.S.A. large quantities of nuts are used to make a medicine, valuable in certain heart ailments. Grown in plantations for the sake of the nuts, the Exile tree would be a source of considerable profit if medical men in this country made as full a use of it as they do in the States.

T. peruviana has been described as a variety, but I am of the opinion that it is another name for the same shrub.

The name *Thevetia* was given in honour of M. Andre Thevet, a French monk of the 16th Century and *neriifolia* means "having leaves like the *Nerium* or Oleander." But there is no relation between these two shrubs, the Oleander being from the Mediterranean and the Exile Tree from South America and the West Indies.



INS:

D. C. LOWEN

YELLOW OLEANDER



INS:

BY COWEN

RANGOON CREEPER

RANGOON CREEPER

QUISQUALIS INDICA

Huchki (Vern.)

THE name *Quisqualis*, meaning "Who ? what ?" was given to this plant by a Dutch botanist called Rumphius to express his astonishment at the odd behaviour of the species. A new plant grows for the first six months as an erect shrub, then it sends out a runner from the roots which soon becomes stouter and stronger than the original stem. This runner, by means of tenacious spines, which have developed from the stalks of fallen leaves, climbs neighbouring trees—sometimes to a considerable height—and becomes a large, woody creeper. It does not twine or cling by means of tendrils as do many creepers. Apart from this peculiarity in its early growth the life of the Rangoon Creeper is quite normal. It is a charming plant, a native of Burma and the Malayan Archipelago, and thrives well in most parts of India, being frequently cultivated in gardens. Fresh green leaves set off the clusters of pendent pink and white blossoms and the attractive appearance is enhanced by the delicious perfume.

The oblong, pointed leaves are opposite and from 1 to 4 inches long, deeply veined and slightly downy.

When tiny the pink buds grow erect but as the slim, lime-green stalks extend to several inches the buds droop and open. These long stalks are actually the calices which are in the form of slim tubes dividing into five segments, between which are inserted the five oval petals, forming a pink star. On first opening the flowers are white or part white and part pink but later they become completely pink and darken considerably before withering. They appear from March until May and again after the rains.

The black fruit is smooth and pointed, dry and five-winged and about 1 inch in length.

A bitter liquid is produced from pulped, unripe fruit and used as a vermifuge. When ripe, the fruit can be eaten, but only in moderation as an excess quickly causes nausea and hiccupping. The leaves, too, are edible and have a warm, pungent taste like radishes.

POINSETTIA or CHRISTMAS PLANT

POINSETTIA PULCHERRIMA or *EUPHORBIA PULCHERRIMA*

As there are few flowers to brighten our gardens around Christmas time, the flamboyant Poinsettia, with its bright-red bracts, is deservedly popular. It came originally from Mexico and was named after Ambassador Poinsett of South Carolina, who brought the first plants from there in the middle of the 19th Century. Now it is found in most parts of the world, in green houses in the colder climes and out-of-doors in tropical and sub-tropical countries. There are many varieties, all with the same peculiarity—extreme degeneration of the flowers. The coloured leaves are not part of the flowers but just bracts, brightly coloured to attract insects as in the Bougainvilleas and other plants. The rounded, bud-like formations, with up-standing stamens and peculiar lateral protuberances, are not flowers at all but clusters of degenerated flowers. Each "stamen" is all that exists of a male flower, and the bulky "pistil" is all there is of a whole female flower. Some of the varieties are very far removed from our gay garden plant, being nothing but roadside weeds. Others are like miniatures with only a small area of scarlet, others have no scarlet at all but an ugly greenish-yellow instead. Horticulturists have introduced still more varieties, so now we have double forms, forms where the red is replaced by pink or yellow or white and some with variegated leaves. But I do not think any of these is an improvement on the original scarlet.

The Poinsettia has a short, thick trunk and rough, brown bark. The branches are slender and green and spread into an open bush formation, bearing most of their leaves towards the end. New leaves are soft, bronze and downy, later becoming green and then hard and leathery, deeply scored by the veins. Each branchlet ends with a circle of bracts surrounding a small cluster of "flowers." The bracts are about 5 inches long and half that in width.

A characteristic of many poisonous plants, it should be noted, is a milky-white sap which exudes from a part or all of the plant when cut. Poinsettia is no exception and one should exercise great care in handling cut branches. However, as the freshness departs from both leaves and bracts very soon after cutting, it is a useless plant so far as indoor decoration is concerned.



INS: 1

D.V.COWEN

POINSETTIA



DR. COWEN

CORAL CREEPER

CORAL CREEPER, SANDWICH ISLAND CREEPER,
or HONOLULU CREEPER

ANTIGONON LEPTOPUS

THIS pretty little creeper is deservedly popular for its lovely sprays of delicate pink flowers. Its original home was South America, but for many years now it has been planted in gardens all over the East where it has established itself as a hardy perennial well suited for covering fences, walls or pergolas—an asset to any garden.

It is a deciduous plant, the leaves falling in February and for the next few months it presents a very bedraggled appearance unless trimmed and tidied up. But, to make up for this, the two flowering periods are each quite long—all through the rains and for several weeks during the cold season. Then, the fresh green leaves and tangled clumps of globular, pink flowers make a pleasing picture.

The long, curled flower sprays bear numerous side stems, many of them springing from the axils of leaves. Along one side of these stems cluster numerous $\frac{1}{2}$ inch, round flowers diminishing in size to tiny pale pin-heads towards the end. Beyond them the stem often divides into three segments like hooks, by means of which the spray attaches itself to neighbouring stems. When fully open the flower is a deep cup, displaying the orange anthers within.

The leaves are heart-shaped or triangular, pointed and up to 3 inches in length. Rising from the stalk on short, pink stems, they bend and fold in every direction. The surface is furrowed by the deep indentations of the veins and the edges are slightly wavy. They are a bright green in colour, paler beneath.

The fruit is a small nut, sheathed by five heart-shaped "leaves" which form wings. These are green at first, later becoming brown and brittle. They develop in clusters similar to the flowers.

There are several varieties. A *leptopus alba* has white flowers, and *A. amabilis* rose coloured flowers. *Amabilis* means "lovely." *A. insigne*—meaning "the remarkable *Antigonon*"—is grown less extensively but is more attractive with its slightly larger flowers and deeper shades of pink.

The word *Antigonon* itself is derived from two Latin words—*anti*, "against" and *gonum*, an "angle."

MOONBEAM

CEYLON JASMINE, WAX FLOWER or BROAD-LEAVED ROSEBAY

TABERNÆMONTANA CORONARIA or *ERUATUM CORONARIA*

Chandnee, Tagari, Tagai Nandet (Vern.) ; *Firki-tagar* (Single),
Bara-tagar (Double) (Hind.)

You have only to look at this shrub on a moonlit night, the glowing whiteness of the flowers standing out against the dark, shining leaves to understand why it is called *Chandnee* or Moonbeam. Its unwieldy Latin name comes from a 16th Century Botanist called Tabernæmontanus and a word meaning "used for garlands." The country of origin is unknown but for years it has been a popular garden shrub in India. It is evergreen, grows to a height of 6 feet or so and bears scattered clumps of dazzling, white flowers, more abundant on those bushes which get plenty of sunlight. Branches and twigs are ashy and wrinkled, marked by the bases of past leaf shoots. These shoots are green, polished and branched and terminate in pairs of leaves growing crosswise to each other. Young leaves are a rich, glossy green, becoming darker and even more glossy with age. Growing to 4 inches in length they are pointed ovals, narrowing down to the short stalk and indented by the veins.

Flowers are usually double, a pale yellow tube rising from a small, yellowish calyx and spreading out into round, overlapping, wavy-edged petals, the whole forming an exquisite gardenia-like bloom nearly $1\frac{1}{2}$ inches across. Their delicate fragrance increases towards evening, and cut sprays make a charming table decoration. Deccan women use them as buttons and all Indian women like to wear them in their hair.

The three-ribbed fruits, each from 1 to 3 inches in length, are spreading, like a pair of horns, and contain red, fleshy seeds which, when pulped, make a good red dye.

It is quite a useful shrub, as a good resin is contained in the milky juice which exudes from cut branches. The roots, also, are valuable either as a vermicide or, mixed with lime-juice, as a cure for certain eye diseases. The juice from the leaves also has this latter property and is a remedy for ophthalmia. Perfumes are manufactured from the delightfully fragrant wood and it is burnt as incense.



MOONBEAM



GOLDEN SHOWER



PURPLE WREATH

PURPLE WREATH

PETREA VOLUBILIS

SUCH a sharp contrast between the soft, delicate flowers and the harsh, crisp leaves of the Purple Wreath is most unexpected. Even the new leaves are stiff and papery. Another woody climber, *Congea tomentosa*, also has this characteristic, but to a lesser degree.

The Purple Wreath was introduced from tropical America many years ago and has always been popular as a garden shrub, usually as a climber, but sometimes over a support where it is encouraged to twine around its own branches. It is described as a woody vine and has a grey bark. A strong climber, it will attain great height and cover a considerable area if left unpruned. Over a porch or along a verandah it makes a glorious show in the spring when the innumerable, long, mauve flower sprays appear. There is also a lesser flowering season towards the end of the year. The tapering clusters bear many pale, blue-mauve stars, becoming deeper in colour towards the end. They grow nearly in pairs, on a short stem and usually turn so that each flower faces the light. But what we take to be the flowers are actually the calices which remain after the flowers have fallen. The true flower is a small, five-petalled affair of deep purple velvet which may be seen resting in two or three of the end calices. One purple petal has a white splash in the middle. These flower sprays spring from the axils of the leaves and are usually pendent and gracefully arched. The plant does not bear fruit in India.

The oval leaves are quite large—up to 5 or 6 inches and deeply veined. Stiff and rough, they are a dull-green above and brighter underneath. New leaves are a fresher green but also stiff—never soft and limp like the young leaves of most plants.

This is a charming flower to cut for the house but it will be found that, if the woody stem is cut, the blooms will rapidly droop and die. If, however, the flower-sprays only are cut and arranged in a shallow bowl, they will remain fresh for several days.

The name *Petrea* was given to commemorate the name of Lord Petre, who, in the 18th Century, became famous for his wonderful collection of exotic plants. *Volubilis* means "twining."

GOLDEN SHOWER

BIGNONIA VENUSTA

Tanga-Poo (Vern.)

THERE are many *Bignonias*, generally known as Trumpet Flowers, and the name of this one means "charming" or "beautiful." It is an extensive climber and, during February, clumps of its brilliant orange flowers may be seen even as high as the tops of tall trees. The green stems are strong and angled, bearing, on longish stalks, pairs of leaflets up to $2\frac{1}{2}$ inches in length. Actually the normal growth of the plant produces three leaflets, but the centre one either never develops or is transformed into a long tendril divided at the end into three tiny hooks. This contracts spirally after laying hold of some object and, having a certain elasticity is considerably stronger than its frail appearance would lead one to imagine. The tips of the tendrils, after attachment, often turn into small discs. The leaves are bright, dark-green, shiny above and rather hairy beneath.

The calyx is tiny and loose fitting, a round cup minutely toothed at the rim. From it emerges the rich, shining, orange tube of the flower, expanding at the mouth and dividing into five, white-edged lobes, the two lower ones of which are partly united. These flowers appear in dense, drooping clusters between February and April and, although without perfume and with a very short flowering season, the plant is an ornament in any garden. Trained along a garden fence or over an old tree stump, it remains effective throughout the year. Densely evergreen, the plant never becomes straggly or untidy and during its brief flowering season the splendid beauty of the honeysuckle-like blooms are a joy to see.

Another handsome creeper of the same genus is the Purple Bignonia (*Bignonia purpura*), with dark green, glossy leaves and thick clusters of lovely purple trumpet flowers.

RED BELL BUSH

WOODFORDIA FLORIBUNDA

Dawa, Santha (Hind.) *Dhauri* (Bombay); *Phulsatti, Dhaiti* (Mar.)

THE Red Bell Bush is a spreading, leafy shrub, small in size but very conspicuous on dry, rocky hillsides from December to May, when the masses of little fiery bells give a bright touch of colour to the drab terrain. It is common in the South Konkan and on the Ghats and ascends the Himalayas to 5,000 feet, but is more rare in South India.

It is a deciduous shrub, usually with a much fluted stem. The grey bark is exceedingly thin and peels off in flakes. When in flower the bush appears twiggy and formless but entirely swathed in red. This is because the small flowers grow singly or in groups all the way along the branches and side twigs, and it is at this time that the leaves fall. Each flower, borne on a tiny stem, is a slender tube, slightly curved, the greenish base of which is the calyx. Swelling slightly, the tube divides into narrow, pointed lobes and from within emerges a bunch of long stamens. The whole length, including the stamens is not more than $\frac{3}{4}$ inch. The fruit is a small, oblong capsule, covered by the withered calyx.

The narrow, pointed leaves grow straight from the branches, either opposite or in whorls of three. They are harsh and dull, dark-green in colour, but paler underneath. Sometimes they are dotted beneath with small, black glands.

From the flowers, which contain much tannin, a red dye is obtained which is used to dye silks. The leaves also contain a large proportion of tannin and make the commonest tan in India.

TREE OF SORROW

NYCTANTHES ARBOR-TRISTIS

Harsinghar (Hind.) ; *Khurasli Parajit* (Mar.) ; *Paghala* (Tam.)

THIS is a very common wild shrub, usually seen as a thick, tangly bush, but becoming a small tree if encouraged to grow freely. The small, creamy-white flowers have a surprisingly powerful scent and, as they open in the evening and fall early in the morning, they permeate the night air with a most delicious fragrance. They cluster at the ends and along the sides of branchlets which spring from the axils of the leaves. Seven slim petals, unequally lobed and somewhat rolled and twisted, surround a brilliant orange tube little more than a quarter of an inch in length. Each little flower sits in a pale green, stalkless cup, sheathed by a wee leaflet, up to five flowers forming a head.

The fruit is quite large in comparison with the flowers. Round and flat, it is compressed round the edges revealing the shape of the two seeds within. At first a rich green, it later becomes brown and brittle.

The leaves vary in size, the largest being about 4 by $2\frac{1}{4}$ inches. They grow opposite, have a short, strong stalk, a rounded base and pointed apex. Dark green on the upper surface, they are silvery green underneath, the silveriness caused by a multitude of fine hairs. So rough and hard are these leaves that they are frequently used as fine sandpaper for polishing.

The flowers, as one would expect, are often included in garlands and from the orange tubes a rich dye is obtained. This gives the colour used for the robes of Buddhist priests and is a suitable dye for Tussore silk.

This shrub, which is found in the sub-Himalayan forests and other northern and central hills, is an important constituent of the undergrowth for it densely covers the ground, forms humus and is rarely eaten by goats. It gives an excellent fuel and makes a batten base for tile or grass thatch roofs and so is cultivated freely in other parts of India. The principal flowering time is December but blooms appear off and on throughout the year. The Gods of the Forest usually receive an offering of these flowers for favouring the *Shikari* and they are often used for garlands and placed on biers.

The names *arbor-tristis* and Tree of Sorrow refer to the night-flowering habit of the plant. Only a sad tree, it was said, would open its flowers at evening and let them fall at dawn.



RED BELL BUSH



TREE OF SORROW



INS: 1

DA CONVEN

YELLOW ELDER

YELLOW ELDER *or* TRUMPET FLOWER

TECOMA STANS

THE Yellow Elder is native to South America, but is now widely naturalised in tropical regions. Its handsome, yellow flowers and elegant foliage have made it a popular garden shrub, and it is one which retains its attractive appearance practically throughout the year. Growing nearly to the size of a small tree and branching quite low, it bears its bright green foliage almost to the ground. The bark is light-brown and corky.

The leaves are large, with a long stalk and are divided into between five and eleven leaflets. These grow in pairs, each pair being in opposite direction to the previous pair. Each leaflet is from 2 to 7 inches long, with a wedge-shaped base, long, tapering point and serrate edge. They are, smooth but not glossy and a bright, pale green, paler underneath. The end leaflet is usually the longest. When new the leaves are a beautiful fresh colour, but after the dry season they become dull and tired.

The clear yellow, fragrant flowers appear in close, drooping clusters from the ends of the branchlets. They do not top the foliage as do the flowers of so many of our trees, but hide amongst the branches, in and around the shrub. Each bloom is a 2 inch trumpet which, on emerging from the pale green calyx, suddenly bellies out and opens into five wavy lobes. Three of these lobes lie straight, the upper two fold back and the whole flower measures some $1\frac{1}{2}$ inches across. Inside, the throat is delicately etched with orange.

The principal flowering seasons are during the rains and the cold weather, but most shrubs produce a few clusters throughout the year. As the flowers fall before they wither and the shrub has the capacity of seeding itself, the ground below a Yellow Elder is often scattered with blossoms lying amongst numerous little sprouting shrubs.

There are several varieties of *Tecoma*. *T. undulata* and *T. capensis* have bright orange flowers, *T. chrysanthia* is yellow-flowered. *Stans* means "erect."

RAILWAY CREEPER or PORTER'S JOY and MORNING GLORY

IPOMEA PALMATA and *IPOMEA LEARII*

ONE of the commonest yet most useful of the evergreen creepers, refreshing the eye in the hottest weather with its clear, green leaves and delicate, mauve blooms, the Railway Creeper is found in gardens, villages, and on practically every Railway Station, thus earning for itself its two nicknames. It is the easiest plant to propagate, grows quickly and produces its charming, ephemeral flowers every morning of the year. Ipomeas are of the *Convolvulaceae* family, of which there are several hundreds, found in most tropical or sub-tropical countries. The flowers are either salver, bell or funnel-shaped and usually brightly coloured, large and showy. Those of the Railway Creeper are salver-shaped, about $2\frac{1}{2}$ inches across and of a soft, mauve shade, enriched by a throat of bright purple. The calyx is a round, green cup born on a short stalk. A characteristic of all Ipomeas is revealed by a close examination of flower and bud. Most of the flower is soft and delicate but there are five long, narrow triangles from the centre to the edge which are smooth and strong and of a slightly different shade. The buds, which are long cones twisted to the right, are folded so that all the delicate parts are within, protected on the outside by these five firm triangles.

The leaves are small and deeply cleft into seven lobes of varying sizes. They rise on short stalks from the soft, round, green stems. These frequently end in tendrils which twine themselves very firmly around any branch they meet.

Morning Glory is a name given to two varieties of *Ipomea*. One is *I. learii* whose large purple-blue flowers are more often seen in a cultivated state than wild. Trained over a screen it is a magnificent sight in the early mornings, rich green foliage studded with large purple discs. In shade their beauty lasts till afternoon but the heat of the sun quickly drains their bold colour; they fade to mauve, crumple and fall. The five firm divisions are crimson purple, the throat and corolla tube mauve; the calyx is a narrow tube dividing into five slim, pointed sepals.

The leaves vary considerably in size and shape; the largest are about 4 inches long and as much across, heart-shaped and either entire or three to five lobed. Smaller ones are more often deeply lobed but sometimes entire, narrow and pointed.

The other Morning Glory is *I. rubro cærulea*, found growing wild in much the same localities as the Railway Creeper. The flowers are the same colour as *I. learii* but slightly smaller and the throat and corolla tube are white; the five sepals are long and pointed. The leaves are from 1 to 5 inches long, heart-shaped and three lobed, borne on a long stalk. Leaves and stalks and round brown stems are all clothed in long, dense hairs. This alone serves to differentiate the two species.



MORNING GLORY (*top*) ; RAILWAY CREEPER



INS:

DR COWEN

CRIMSON IPOMEA

The beautiful night-flowering Moonflower (*I. bonanox*) is of the same family. An exceedingly fast grower, its large, black seeds can germinate in 24 hours. It is fascinating to watch the large, scented flowers unfold at sunset. Within ten minutes the long, twisted bud has opened into a glorious, white salver. By moonlight they have a mysterious, silvery charm.

The Sweet Potato (*I. batatas*) is another member of the family. It is more inclined to creep along the ground than climb. The flowers are in clusters of three or four, whitish outside and purple within. There are two varieties; one has red tubers, the other white. The former is thought to be the best. In England they were considered a great delicacy long before the introduction of our common potato, and are both palatable and nutritious.

I. carnea has large campanulate flowers—rose or pale pink in colour. It is a sturdy bush—less of a climber—with large, smooth leaves. The Crimson Ipomea (*I. horsfalliae*) is another of the family and is rapidly becoming more popular, in spite of the fact that it is often rather difficult to propagate. It makes a fine show covering a trellis, along a verandah or round the bare trunks of old trees. It is evergreen but, unlike those *Ipomeas* which flower throughout the year, blooms for a couple of months only at the beginning of the year. Masses of round, green buds appear and from them protrude glossy, rose-crimson corollas, shining like polished metal. Daily these open into lovely, funnel-shaped flowers, each about 2½ inches in length. They have no perfume but make up for this lack by their brilliance and beauty. The leaves are palmately divided into five narrow lobes with undulated margins and vary greatly in size.



THE GLORY LILY or TIGER'S CLAWS

GLORIOSO SUPERBA

Bishnangul (Vern.) ; *Cariari* (Hind.) *Coatijan* (Tam.)

WALKING and riding in some of our fine, open country is becoming increasingly popular and those who take particular pleasure in that shrubby, palm-studded country which, during the early part of the monsoon, becomes clothed in verdant green, cannot fail to have noticed the flaming colours of the Glory Lily twining among the bushes. Many have risked scratches and tears to pluck a few sprays. Placed in vases when they practically arrange themselves their lasting charm and freshness well repays any trouble taken in the plucking.

It is a herbaceous climber, dying down during the dry season and the tubers remaining dormant until the following rains. Therefore, it is a fragile plant with soft, round, green stems. The bright, smooth leaves are variable in length and breadth, stalkless and often terminate in spiral tendrils which cling tenaciously to anything they touch. They grow singly or opposite, are lance-shaped, broadest in the middle and fold over at the base.

The flowers, conspicuous against the fresh green of monsoon growths, change colour as they open and present lovely variations of yellow, orange and crimson. They grow singly on long stems which bend over at the tip. As buds they are pendent ovals with prominent, rounded wings. On opening the six long, frilly petals bend right back from the small keel lying in each channelled base. Green at the bottom they shade to pale yellow and become abruptly orange at the end, the centre rib and edges remaining yellow. The six protruding stamens—like yellow mallets—soon open out into spoke formation and the orange of the petals becomes vermillion. From the large, green ovary the pistil juts out sideways. Age changes the yellow to orange, then each petal becomes entirely crimson and stamens and petals lie alongside—altogether an unusual form of inflorescence.

Many fatal cases of poisoning among the poor have been reported, caused by the fleshy tubers of the Glory Lily having been mistaken for yams. On the other hand there are some writers who say it has not been proved to be a virulent poison; but it is generally agreed that, like many poisons, small doses are definitely tonic. Made into a paste, the roots are widely used among village women to promote labour.

In Guiana the juice of the leaves is used to destroy hair lice.

There are several varieties, differing in the size of the flower and the distribution of the yellows and reds.



INS:

BLLOWEN

GLORY LILY



HEAVENLY BLUE



ALLAMANDA

HEAVENLY BLUE

THUNBERGIA GRANDIFLORA

Mulluta (Hind.)

THIS extensive and luxuriant climber is a native of Bengal, Assam and Chittagong but is now found in gardens all over India and Malaya. It can always be recognised by its dense, green curtain of foliage and large, lavender-blue flowers. There are two varieties, one has smooth leaves and flowers when of quite small size and the other has rough, hairy leaves and a more vigorous growth. It is the latter which is described here.

The flowering branches are long and pendant, the blooms being borne opposite—sometimes in pairs—every couple of inches. Up to five or six may be seen open along each branch. Each flower consists of a longish stem, a thick, green calyx heavily streaked with purple-red and a long, broad corolla. The calyx is contracted towards the base, pointed at the apex and nearly divides into two segments when the corolla emerges. This corolla is from two to three inches long. The tube is whitish outside, more yellow within and contracts upwards in the middle before dilating into a bell-shape which opens into five round, spreading lobes. The base of each lobe, particularly the lower, protruding one, is smudged with white. The rest is a lovely, pastel mauve. Before they wither the flowers fall leaving for a while the empty calices.

The leaves vary considerably in size, shape and colour. New ones are a bright, clear green after they have passed the pink-tinged baby age and are narrow ovals tapering to a long point. Old leaves are a deep, dark-green and much broader, sometimes almost heart-shaped. The edge is either entire or develops two or three indefinite, pointed lobes. On 3 inch stems, the leaves are opposite and fairly widely spaced along the stout branches. Sometimes, though, the leaf branches are long and slender and terminate in bracts.

There is a white variety which has slightly larger flowers and leaves with more definite lobes.

I do not know whether Indians make any use of this plant beyond that of decoration, but in Malaya a decoction of the leaves is used in the cure of stomach complaints and also, from the leaves, effective poultices are made.

WILLOW-LEAVED ALLAMANDA

ALLAMANDA CATHARTICA

DR. ALLAMAND of Leyden gave his name to this very showy creep which has now become one of the most popular of garden shrubs. Theer, deep green, shining foliage and waxy, yellow flowers are an attractive contrast and although it is generally considered to be without scent, a faint but rich smell of spices can sometimes be detected.

Originally from America it has been planted so widely in India that it can now be found wild in many parts of the country.

It is a fairly large climber, upright, and climbing to a considerable height under suitable conditions. Trained over a screen it forms an admirable hedge or, pruned into a more compact formation in a tub, it makes a cheerful splash of colour on a verandah. Its capacity for producing flowers throughout the year is another point in its favour even if there is a period when these are few in number, small and imperfect.

Young branches are round and smooth and green, often maroon on the upper side, but with age they turn to ashy brown and become slightly scaly. The leaves sometimes grow in pairs, sometimes in groups of fours. Narrow and pointed they have no stem and are a rich, glossy, green above, much paler below and about 4 inches in length. Being slightly folded and curved their shining surfaces catch every light.

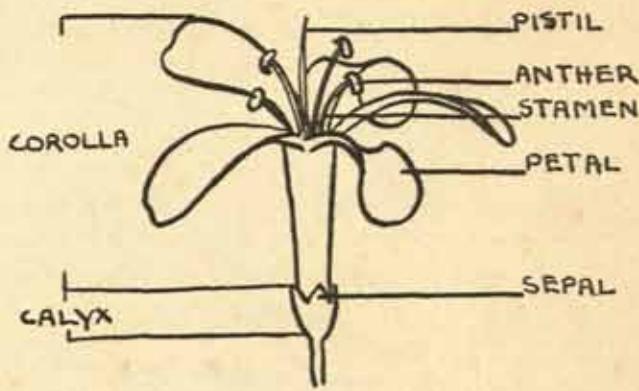
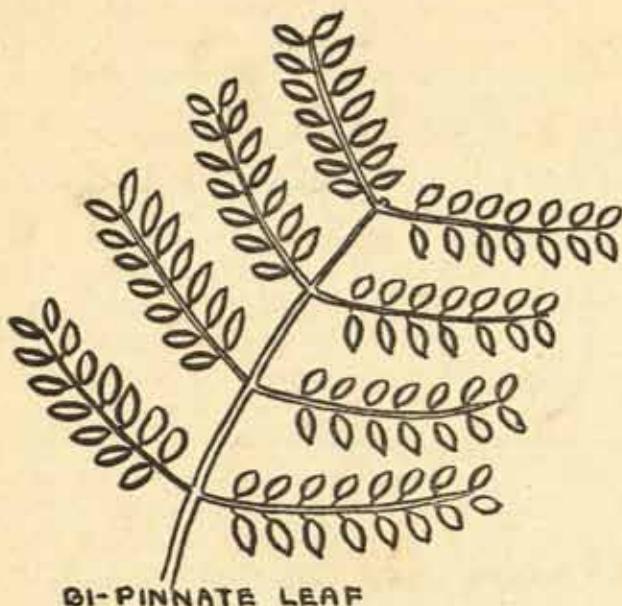
The flowers do not grow from the ends of the branches but from short-stemmed side shoots on which one or two buds may bloom at the same time. These buds in themselves have great charm; twisted to a long point they are a lovely blend of bonze and lime green. Each flower consists of a loose calyx, smooth and slender, dividing into five red-tinged, green sepals, and a funnel-shaped corolla. The corolla tube emerges as a slim cylinder, bellies out and opens into five broad petals, rounded at one side and sometimes having a short point at the other. Inside, the throat is pencilled with deep-orange veins. The whole flower is about $3\frac{1}{2}$ inches in diameter.

There is a variety, *A. violacea*, quite distinct from all other species and varieties in the colour of its flowers which are violet, purple or purple-brown. It is a handsome, slender climber.

GLOSSARY

Anther .. The head of the stamen.

Bi-pinnate .. A leaf twice-divided, having lateral stems with lateral leaves.



Bract .. An irregularly developed leaf at the base of the flower stalk or of the flower.

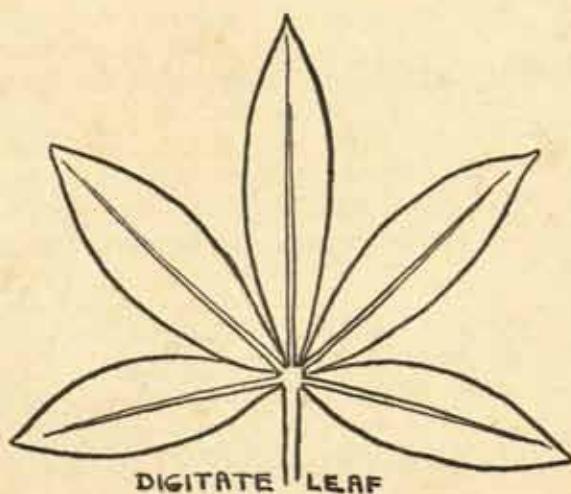
Calyx .. The covering of the lower part of a flower.

Corolla .. A collection of petals—the coloured part of a flower.

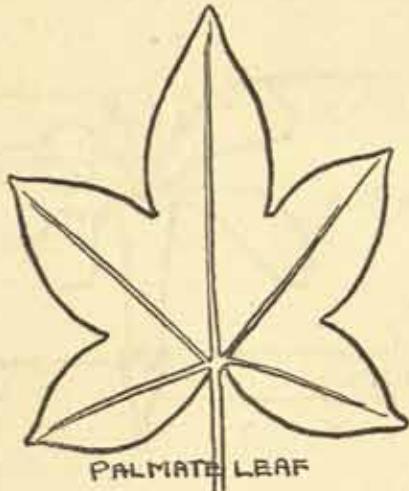
Deciduous .. With leaves which fall—not evergreen.

Digitate .. A leaf with several leaflets radiating from a central point.

Entire .. Having smooth edges.



Epiphyte ... A plant growing on another plant, but without deriving nourishment from it.
Leaflet ... One of several leaf-like growths, which together, form a leaf.
Lobe ... A division of a leaf.
Palmate ... A leaf having 5 definite lobes.
Parasite ... A plant which lives on and takes nourishment from another plant.



PALMATE LEAF



PINNATE LEAF



SERRATE-EDGED LEAF

Petal ... A segment of the corolla.
Pinnae ... The lateral stems of a bipinnate leaf.
Pinnate ... A leaf which is divided into lateral leaflets.
Pistil ... The female organ of a flower consisting of ovary, style and stigma.
Sepal ... A segment of the calyx.
Serrate ... Toothed.
Spatha ... Flowers enclosed in sheaths while in bud.
Stamen ... The male organ of the flower, consisting of filament and anther.
Stigma ... The head of the pistil.
Stipule ... A leaf-like appendage at the base of the leaf stalk.
Style ... The stem of the pistil.
Whorled ... Arranged in a circle round a stem.

INDEX TO ENGLISH AND SCIENTIFIC NAMES

A.

Acacia Arabica, 62
Acacia Catechu, 98
Acacia Lebbek, 38
Acacia Scorpioides, 62
Adansonia Digitata, 21
Albizia Lebbek, 38
Allamanda Cathartica, 128
Allamanda Violacea, 128
Aloe Wood, 76
Antigonon Amabilis, 117
Antigonon Insigne, 117
Antigonon Leptopus, 117
Antigonon Leptopus Alba, 117
Arjun, The, 34
Areca Catechu, 98
Areca Palm, The, 98, 99, 100
Artocarpus Heterophyllus, 39
Artocarpus Integrifolia, 39, 42
Asoka, 5
Azadirachta Indica, 15

B.

Babul, The, 38, 62
Banana Tree, The, 83, 84, 85
Banyan, The, 63, 64
Baobab, The, 21, 22
Barbadoes Pride, 104
Bassia Latifolia, 73
Bauhinia Acuminata, 23
Bauhinia Purpura, 23, 24
Bauhinia Tomentosa, 23, 24
Bauhinia Variegata, 23
Bead Tree, The, 70
Bearded Ixora, The, 111
Belleric Myrabolan, The, 33, 34
Betel-nut Palm, The, 86, 98, 99, 100
Bignonia Cropsa, 45
Bignonia Megapotamica, 45
Bignonia Purpura, 120
Bignonia Venusta, 120
Bombax Malabaricum, 6, 7, 25
Borassus Flabellifer, 90, 91
Bo Tree, The, 65, 66
Bottle Palm, The, 94
Bougainvillea Buttiana, 106, 107
Bougainvillea Crimson Lake, 107
Bougainvillea Glabra, 106

Bougainvillea, Lady Hudson, 107
Bougainvillea, Laterita, 106
Bougainvillea, Louis Walther, 107
Bougainvillea, Mrs. Butt, 107
Bougainvillea, Mrs. McLean, 107
Bougainvillea, Peruviana, 107
Bougainvillea, Princess Margaret Rose, 107
Bougainvillea, Rosa Catalina, 106
Bougainvillea, Scarlet Queen, 107
Bougainvillea, Spectabilis, 106
Broad-leaved Rose-bay, 118
Burmese Pink Cassia, 29, 30, 31
Butea Frondosa, 3
Butea Monosperma, 3

C.

Cæsalpinia Pulcherrima, 104
Camphire, The, 109
Careca Papaya, 81
Caryota Urens, 92
Cassia Fistula, 52
Cassia Grandis, 29
Cassia Javanica, 29, 30, 31, 32
Cassia Marginata, 29
Cassia Multijuga, 54
Cassia Nodosa, 29, 30, 32
Cassia Renigera, 29, 30
Cassia Siamea, 54
Casuarina, The, 57, 58, 59
Casuarina Equisetifolia, 57
Ceylon Jasmine, The, 19, 118
Champa, The, 19
Changeable Rose, The, 112
China Rose, The, 112
Christmas Plant, The, 116
Cochlospermum Gossypium, 8
Coconut Palm, The, 86, 87, 88, 89
Cocos Nucifera, 87, 89
Connessi Bark, The, 75
Confederate Rose, The, 112
Congea Tomentosa, 119
Coral Creeper, The, 117
Coral Hibiscus, The, 118
Coral Tree, The, 25, 26, 27
Cordia Myxa, 76
Cordia Sebestena, 76
Cork Tree, The, 49, 50

Copper-Pod, The, 55
 Cotton Rose, The, 112
 Crepe Flower, The, 28
 Crepe Myrtle, 28
 Crimson Ipomea, The, 125

D.

Date Palm, The, 86, 96, 97
 Dead Man's Flower, 19
Delonix Regia, 1
 Dhoby Tree, The, 105
 Drumstick Tree, 69
Duranta Ellisii, 102
Duranta Plumeri, 102

E.

Easter Tree, The, 75
 Egyptian Privet, The, 109
Eriodendron Anfractuosum, 8
Eruatum Coronaria, 118
Erythrina Indica, 25, 27
Eugenia Jambolana, 13
Euphorbia Pulcherrima, 116
 Exile Tree, The, 114

F.

Ficus Bengalensis, 63
Ficus Carica, 65
Ficus Elastica, 66
Ficus Glomerata, 65
Ficus Religiosa, 65
 Fish-tail Palm, The, 86, 92, 98
 Flamboyant, 2
 Flame of the Forest, The, 3, 4
 Flame Tree of the Woods, The, 110
Fleur de Paradis, 2
 Flower of China, 19
 Fountain Tree, The, 48
 Frangipanni, 19, 20
 Frywood Tree, The, 38

G.

Geranium Tree, The, 24
Gliricidia Alba, 68
Gliricidia Maculata, 67, 68
Gliricidia Sepium, 67
Glorioso Superba, 126
 Glory Lily, The, 126
 Golden Dewdrop, 102
 Golden Shower, 52, 120
Gossampinus Insigne, 7
Gossampinus Malabaricum, 6
Guaicum Officinale, 60

Gul Mohr, The, 1, 2
Gum Guaicum, 60, 61
Gum Officinale, 60

H.

Heavenly Blue, 127
 Hennah, 109
Hibiscus Micranthus, 113
Hibiscus Mutabilis, 112
Hibiscus Rosa Sinensis, 112
Hibiscus Schizopetalus, 112, 113
Hibiscus Syriacus, 112, 113
Holarrhena Antidysenterica, 75
 Honolulu Creeper, The, 117
 Horse Cassia, The, 29, 31
 Horse-radish Tree, The, 69

I.

Indian Alspice, The, 13
 Indian Almond, The, 34
 Indian Butter Tree, The, 73, 74
 Indian Date, The, 47
 Indian Jujube, The, 77, 78
 Indian Laburnum, The, 52, 53, 54
 Indian Lilac, The, 28
 Indian Tulip Tree, The, 71
 India-rubber Tree, The, 66
Ipomea Batatas, 125
Ipomea Bonanox, 125
Ipomea Carnea, 125
Ipomea Horsfalliae, 125
Ipomea Learii, 124
Ipomea Palmata, 124
Ipomea Rubro-Cærulea, 124
Ixora Barbata, 111
Ixora Chinensis, 111
Ixora Coccinea, 110
Ixora Fulgens, 111
Ixora Griffithii, 111
Ixora Lutea, 111
Ixora Parviflora, 110
Ixora Rosea, 110
Ixora Singaporensis, 111
Ixora Undulata, 111

J.

Jacaranda Acutefolia, 12
Jacaranda Mimosafolia, 12
 Jacaranda, The, 2, 12
 Jack Fruit Tree, The, 39, 40, 41, 42
 Jamaica Mignonette, 109
 Jambolana, 13
 Jasmine Tree, 19

N.

Java Cassia, 31, 32
 Java Plum, 13, 14
 Jonesia Asoka, 5
 Jujube, The, 77, 78
Nerium Odorum, 103
Nerium Indica, 103
 Nim Tree, The, 15, 16, 48
Nyctanthes Arbor-Tristis, 122

K.

Kitul Palm, The, 92

L

Lagerstræmia Flos-Regina, 28
Lagerstræmia Indica, 28
Lagerstræmia Speciosa, 28
Lantana Aculeata, 108
Lantana Alba, 108
Lantana Camara, 108
Lantana Chelsonii, 108
Lantana Cloth of Gold, 108
Lantana Coccinea, 108
Lantana Delicatissima, 108
Lawsonia Inermis, 109
 Life Tree, The, 19
Lignum Vitæ, 60, 61,
 Lucky Nut, 114

M.

Madhuca Indica, 73
 Madre, The, 67, 68
Mangifera Indica, 35
 Mango, The, 35, 36
 Margosa Tree, The, 15
 Mast Tree, The, 79
Melia Azedarach, 16, 70
 Milky Champa, 19
Millingtonia Hortensis, 49
 Mohwa, The, 73, 74
 Monkey-Bread Tree, The, 21, 22
 Monkey-Sticks, 52
 Moonbeam, 118
 Moonflower, 125
Moringa Aptera, 69
Moringa Oliefera, 69
Moringa Pterygosperma, 69
 Morning Glory, 124, 125
 Mountain Ebony, The, 23, 24
 Mountain Glory, The, 94
Musa Sapientum, 83, 84
Mussænda Corymbosa, 105
Mussænda Erythrophylla, 105
Mussænda Frondosa, 105
Mussænda Luteola, 105
 Myrabolan, 33, 34

O.

Oleander, 108
Oreodoxa Regia, 94

P.

Pagoda Tree, The, 19, 20
 Palms, 86-100
 Palmyra Palm, The, 86, 90, 91
 Papaya, The, 81, 82
 Papaw, The, 81, 82
 Paper-chase Tree, The, 105
 Parrot Tree, The, 3
 Peacock Flower, The, 1, 2, 104
 Peepul Tree, The, 65, 66
Peltophorum Inerme, 55, 56
Peltophorum Ferrugineum, 55, 56
 Persian Lilac, 69, 70
 Persian Rose, The, 112
Petrea Volubilis, 119
Phænix Dactylifera, 97
Phænix Sylvesteris, 96
Phyllanthus Emblica, 33
 Pink Cassia, The, 12, 29, 30, 31, 32, 54
 Pink Ixora, The, 110
Pithecolobium Saman, 37
Plumeria Acutifolia, 19
Plumeria Alba, 20
Plumeria Rubra, 20
Poinciana Pulcherrima, 104
Poinciana Regia, 1
Poinsettia Pulcherrima, 116
Polyalthia Longifolia, 79, 80
 Pongam, The, 51
Pongamia Glabra, 51
Pongamia Pinnata, 51
 Poon Tree, The, 9, 10, 11, 34
 Porter's Joy, 124, 125
 Portia Tree, The, 71
 Pride of India, 70
 Pudding Pipe Tree, The, 52
 Purple Bauhinia, The, 24
 Purple Bignonia, The, 120
 Purple Wreath, The, 119

Q.

Queen's Flower, The, 2, 28
Quisqualis Indica, 115

R.

Railway Creeper, The, 124
 Rain Tree, The, 37, 38
 Rangoon Creeper, The, 115
 Red Bell Bush, The, 121
 Red Cassia, The, 31
 Rio Grande Trumpet Flower, The, 45
Rosa Catalina, 106
 Rose Laurel, The, 103
 Rose of Sharon, The, 113
 Royal Palm, The, 86, 94, 95,
 Rusty Shield-Bearer, The, 54, 55, 56

S.

Salmania Malabarica, 6
Samanea Saman, 37
 Sandwich Island Creeper, The, 117
Saraca Indica, 5
 Scarlet Bell Tree, The, 43
 Scarlet Cordia, The, 76
 Scarlet Ixora, The, 110
 She-Oak, The, 57
 Shoe Plant, The, 112
 Shrubs and Creepers 101-128
 Shrubby Althea, 113
 Siamese Cassia, 54
 Silk Cotton Tree, The, 6, 7, 8, 25
 Siris, The, 38
 Sky Flower, The, 102
 Small-flowered Ixora, The, 110
 Soapnut, The, 82
Spathodea Campanulata, 43
 Spotted Gliricidia, The, 67, 68
Sterculia Alata, 11
Sterculia Colorata, 11
Sterculia Foetida, 9, 11, 34
Sterculia Urens, 11
Sterculia Villosa, 11
 Sweet Potato, The, 125
Syzygium Cumini, 13

T.

Taberanæmontana Coronaria, 118
 Tamarind, The, 15, 47, 48
Tamarindus Indica, 47
 Teak Tree, The, 17, 18
Tecoma Capensis, 123

Tecoma Chrysanthia, 123
Tecoma Stans, 123
Tecoma Undulata, 123
Tectona Grandis, 17
 Temple Tree, The, 19, 20
Terminalia Arjuna, 34
Terminalia Bellerica, 33
Terminalia Catappa, 34
Terminalia Chebula, 33
Terminalia Tomentosa, 34
Thespesia Populnea, 71, 72
Thevetia Neriifolia, 103, 114
Thevetia Peruviana, 114
Thunbergia Grandiflora, 127
 Tiger's Claws, 126
 Toddy Palm, The, 92, 96
 Torch Tree, The, 110
 Torchwood Tree, The, 8
 Tree Jasmine, 49
 Tree of Sorrow, The, 122
 Trumpet Flower, The, 120, 123
 Tulip Tree, The, 43, 44

U.

Umbrella Tree, The, 71

V.

Variegated Bauhinia, The, 23, 24

W.

Wax Flower, The, 118
 White Silk Cotton Tree, The, 8
 Wild Almond, The, 9, 10, 11, 34
 Wild Date Palm, The, 96, 97
 Willow-leaved Allamanda, The, 128
Woodfordia Floribunda, 121
Wrightia Tinctoria, 75

Y.

Yellow Elder, The, 123
 Yellow Oleander, The, 103, 114
 Yellow Silk Cotton Tree, The, 8

Z.

Zizyphus Jujuba, 77, 78

INDEX TO INDIAN NAMES

A.

Akas Nim, 49
 Ala, 63
 Al Khanna, 109
 Am, 35
 Amaltas, 52
 Amba, 35
 Ambli, 47
 Amla, 47
 Anjir, 65
 Aralee, 103
 Arjun, 34
 Arjuna, 28
 Arni, 11
 Ashoka, 79
 Asogam, 5
 Asok, 5
 Asoka, 5
 Assothi, 79

B.

Babul, 38, 62
 Bahera, 33
 Bakain, 70
 Bakora, 110
 Bara-tagar, 118
 Beati, 54
 Bebana, 105
 Beheda, 33
 Ber, 63, 77
 Bhai-koi, 11
 Bhava, 52
 Bhendi, 71
 Bhokar, 76
 Bhutkesh, 105
 Birli, 92
 Bishnangul, 126
 Bodala, 11
 Bor, 66
 Bultar, 90

C.

Cariari, 126
 Champa, 19
 Chandnee, 118
 Chaneri, 108
 Chevaku, 57
 Chinta, 47
 Choruna, 79

Chouk, 57
 Coatijan, 126

D.

Dawa, 121
 Devdar, 79
 Dhaiti, 121
 Dhak, 3
 Dhauri, 121
 Dhudi, 75
 Dowla, 75
 Drasi, 65
 Drek, 70

E.

Eetchum-pannay, 96
 Ellandi, 77

F.

Firki-tagar, 118

G.

Gool-i-toorah, 104
 Gool-i-ujaib, 112
 Gorak Amla, 21
 Gorak Chinch, 21
 Gua, 98
 Gula-chin, 19
 Gulu, 11
 Gurhul Jaswand, 112

H.

Harsinghar, 122
 Huchki, 115

I.

Ilavu, 6
 Imli, 47
 Indrajau, 75
 Ippa, 73
 Iyalvagi, 55

J.

Jaba, 112
 Jaman, 13
 Jambhul, 13

M.

Jarul, 28
 Jasud, 112
 Jiluga, 92
 Jungli Badam, 9, 34
 Juva, 112
 Juwa, 112

K.

Kach-kula, 83
 Kachnar, 23
 Kadali, 28
 Kaner, 103
 Kanji, 51
 Kanthal, 39
 Karai, 11
 Karanj, 51
 Karkku, 49
 Karu-vel, 62
 Kassod, 54
 Kat-illipi, 73
 Kavali, 11
 Kavuki, 49
 Kayla, 83
 Kela, 83
 Khairchampa, 19
 Khaji, 96
 Khajur, 96
 Khakda, 3
 Khenna, 109
 Khurasli, 122
 Khuttian, 6
 Kikar, 62
 Kirudam, 29
 Kishira Champa, 19
 Kolkaphul, 114
 Kondachinta, 55
 Konnai, 52
 Komri, 104
 Kota Gandhal, 110
 Kowsey, 11
 Krishna Choora, 104
 Kudrapdukku, 9
 Kumbi, 8
 Kura, 75
 Kurat, 110
 Kurchi, 75
 Kurish Churin, 104

L.

Lal-kharubee, 103
 Lanchut, 105
 Lasora, 76
 Lendi, 28

Maddi, 34
 Madre, 67
 Madura, 67
 Malla Nim, 70
 Mallay Vembu, 70
 Mamid, 35
 Mangas, 35
 Mari, 63, 92
 Marudani, 109
 Maruka, 25
 Mayarum, 1
 Mehndi, 109
 Mhar, 92
 Mohwa, 73
 Morunga, 69
 Mulluta, 127

N.

Nari Kadam, 87
 Narikel, 87
 Naril, 87
 Nat Vadam, 34
 Naval, 13
 Neredu, 13
 Nim, 15
 Nimbay, 15

O.

Oru, 112

P.

Padiri, 45
 Paghala, 122
 Paku, 98
 Palas, 3, 4
 Palita Mundar, 25
 Pangara, 25
 Pangri, 25
 Pannei, 90
 Papar, 51
 Paparapulia, 21
 Papaya, 81
 Papita, 81
 Pappali-marum, 81
 Parajit, 122
 Parsippu, 71
 Patadi, 43
 Pedda-Eeta, 96
 Pejri, 70
 Perungalli, 19
 Phanas, 39
 Phulsatti, 121

Phultar, 90
 Pila, 39
 Pila Kaner, 114
 Pinari, 9
 Pipal, 65
 Pongam, 51
 Porasum, 3
 Poresh, 71
 Porsung, 71
 Pudma-kurubee, 103
 Puli, 47
 Pumarathu, 28
 Punku, 51
 Pungu, 51
 Purimaram, 21
 Puvarassu, 71

R.

Radha Choora, 104
 Ragi, 65
 Rangam, 110
 Rangan, 110
 Ravi, 65
 Rela, 52
 Rookmini, 110
 Rumbal, 65

S.

Safed Simal, 8
 Saigun, 17
 Saj, 34
 Samarela, 29
 Santha, 121
 Sarvad, 105
 Sawar, 6
 Serva, 57
 Shakta, 69
 Shima Sankesula, 1
 Shindi, 96
 Simal, 6, 8
 Siris, 38
 Sirissa, 38
 Soanjna, 69
 Sona, 24

Suhujna, 69
 Sunkesvara, 1
 Supari, 98

T.

Tagai Nandet, 118
 Tagari, 118
 Tadi, 90
 Tadimar, 90
 Tal, 90
 Talgachh, 90
 Taman, 28
 Tanga-poo, 120
 Tani, 33
 Tantani, 108
 Tchackka, 42
 Tek, 17
 Tenga, 87
 Thaiku-Marun, 17
 Thippalli, 92
 Tintil, 47
 Tula, 11

U.

Udar, 11
 Umbar, 65

V.

Vakai, 29
 Vala, 83
 Valie, 83
 Vaymboo, 70
 Vedchi, 110
 Vepa, 15
 Vepali, 75
 Virigi, 76

W.

War, 63

Y.

Yepa, 15

Z.

Zard Kunel, 114



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